

IMPUTERNICIRE PRODUCATOR

Data: 12.12.2022

Ref.Licitatie: Construcția apeductului magistral Sărata-Răzeși - Voinescu - Mingir din r-nul Hîncești (REPETAT)

Catre: AGENTIA DE DEZVOLTARE CENTRU

Noi Axima Grup SRL, reprezentati legal prin Andrei Prijilevski, in calitate de Director General fiind Distribuitor Oficial al producatorului de pompe WILO SE in Republica Moldova , imputernicim pe SC Laiola SRL cu sediul in Republica Moldova, municipiul Chisinau, str.Calea Basarabiei 26/6 sa depuna o oferta completa al carei scop este furnizarea urmatoarelor produse, al caror producatori suntem:

STATIE DE POMPARE A APEI (PLATFORMA A)

De asemenea suntem de acord ca SC Laiola SRL sa prezinte la prezenta licitatie documentatia tehnica, certificările si avizările sanitare, agrementările si avizările tehnice specifice si sa puna in opera produsele mentionate mai sus.

Semnat de: Andrei Prijilevski

In calitate de: Director General

Semnatura:

Tel: 022 84 44 01

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www.axima.md

Adresa poștală:

Republica Moldova, mun. Chișinău,

str. Gh. Asachi 19 B.

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Ref.Licitatie: Construcția apeductului magistral Sărata-Răzeși - Voinescu - Mingir din r-nul Hîncești
(REPETAT)

Catre: AGENTIA DE DEZVOLTARE CENTRU

Noi Axima Grup SRL, reprezentati legal prin Andrei Prijilevski, in calitate de Director General fiind Distribuitor Oficial al producatorului Verder Romania SRL in Republica Moldova , imputernicim pe SC Laiola SRL cu sediul in Republica Moldova, municipiul Chisinau, str.Calea Basarabiei 26/6 sa depuna o oferta completa al carei scop este furnizarea urmatoarelor produse, al caror producatori suntem:

STATIE DE DEZINFECTARE CONTAINERIZATA AUTOMATIZATA (PLATFORMA B SI C) .

De asemenea suntem de acord ca SC Laiola SRL sa prezinte la prezenta licitatie documentatia tehnica, certificarile si avizarile sanitare, agrementarile si avizarile tehnice specifice si sa puna in opera produsele mentionate mai sus.

Semnat de: Andrei Prijilevski

In calitate de: Director General

Semnatura:

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Adresa poștală:

Republica Moldova, mun. Chișinău,

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FISA TEHNICA – STATIE DE POMPARE SP-1 (Platforma A)

Nr. crt.	Specificații tehnice impuse prin caietul de sarcini	Corespondența propunerii tehnice cu specificațiile tehnice impuse prin caietul de sarcini	Producatorul
1	Parametri tehnici și funcționali <i>Container</i> Stația de pompare va fi amplasată într-un container cu dimensiunile 9000 x 2400 x 2700 mm, compartimentat în 3 zone (zona tehnologică, birou și toaletă; statia de pompare trebuie sa fie echipata cu birou, chiuveta si vas de closet), cu dimensiunile din planșă, cu stâlpi de susținere profilați la rece din tablă zincată cu grosimea de min 2 mm, pereți din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperiș cu rezistență portantă de min 250 kg/m2 , format din structură metalică zincată profilată la rece, grunduită reactiv și vopsită, tablă zincată dublu fălțuită, grosime min 0,5 mm, folie anticondens, vată minerală grosime min 100 mm norma C1 ISOVER®, tavan PVC RAL 9002. Containerul este compartimentat în trei zone și anume: 1. zona tehnologică, în care se vor instala echipamentele tehnologice (grup de pompare, tabloul electric si SCADA etc.); 2. zona de birou, pentru personalul de exploatare, dotat cu mobilier (birou, scaun); 3. zona toaletă, în care se vor prevedea un vas WC și un lavoar. Zona tehnologică va fi prevăzută cu o ușă dublă batantă pe toata lățimea containerului pentru acces în caz de mentenanță la instalația hidraulică și o ușă laterală cu dimensiunile 900x2000 mm, PVC/metalică. Accesul în zona de birou se face din exteriorul containerului printr-o ușă cu dimensiunile 900x2000 mm, PVC/metalică. Accesul in zona toaleta se face din exteriorul containerului printr-o ușă cu dimensiunile 700x2000 mm, PVC/metalică. <i>Instalații climatizare</i> Toate zonele vor fi încălzite utilizând convectoare electrice termostatate cu puterea de min 2000 W, cu montare pe perete. În zona tehnologică, pentru prevenirea apariției condensului, va fi prevăzut un ventilator axial, cu montare murală, cu funcționare temporizată, cu debitul de min 1300 m3 /h, 230 Va.c., max.60 W. Grila de admisie a aerului în zona tehnologică va fi montată în jumătatea inferioară a ușii duble. <i>Instalații electrice</i> Stația de pompare va fi prevăzută cu un singur tablou electric și de automatizare și control al procesului, cu dimensiunile minime 1600 x 400 x 2000 mm. Tabloul electric va fi prevăzut cu: - inversor manual de sursă, pentru posibilitatea conectării unui grup generator portabil (în sursa 1 se va	Parametri tehnici și funcționali Container Container cu dimensiunile 9000 x 2400 x 2700 mm, compartimentat în 3 zone (zona tehnologică, birou și toaletă; statia de pompare este echipata cu birou, chiuveta si vas de closet), cu dimensiunile din planșă, cu stâlpi de susținere profilați la rece din tablă zincată cu grosimea de min 2 mm, pereți din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperiș cu rezistență portantă de min 250 kg/m2 , format din structură metalică zincată profilată la rece, grunduită reactiv și vopsită, tablă zincată dublu fălțuită, grosime min 0,5 mm, folie anticondens, vată minerală grosime min 100 mm norma C1 ISOVER®, tavan PVC RAL 9002. Containerul este compartimentat în trei zone și anume: 1. zona tehnologică, în care se vor instala echipamentele tehnologice (grup de pompare, tabloul electric si SCADA etc.); 2. zona de birou, pentru personalul de exploatare, dotat cu mobilier (birou, scaun); 3. zona toaletă, în care se vor prevedea un vas WC și un lavoar. Zona tehnologică va fi prevăzută cu o ușă dublă batantă pe toata lățimea containerului pentru acces în caz de mentenanță la instalația hidraulică și o ușă laterală cu dimensiunile 900x2000 mm, PVC/metalică. Accesul în zona de birou se face din exteriorul containerului printr-o ușă cu dimensiunile 900x2000 mm, PVC/metalică. Accesul in zona toaleta se face din exteriorul containerului printr-o ușă cu dimensiunile 700x2000 mm, PVC/metalică. <i>Instalații climatizare</i> Toate zonele vor fi încălzite utilizând convectoare electrice termostatate cu puterea de min 2000 W, cu montare pe perete. În zona tehnologică, pentru prevenirea apariției condensului, va fi prevăzut un ventilator axial, cu montare murală, cu funcționare temporizată, cu debitul de min 1300 m3 /h, 230 Va.c., max.60 W. Grila de admisie a aerului în zona tehnologică va fi montată în jumătatea inferioară a ușii duble. <i>Instalații electrice</i> Stația de pompare este prevazuta cu tablou electric și de automatizare și control al procesului, cu dimensiunile 1600 x 400 x 2000 mm.	

conecta alimentarea din rețeaua electrică, iar în sursa 2 se va conecta o fișă industrială trifazată (400 V), montată aparent pe peretele exterior al tabloului electric); - posibilitatea selectării modului de lucru: manual – 0 – automat; - echipamente pentru protecția și comanda pompelor din grupul de pompare; fiecare pompă va fi acționată prin câte un convertizor de frecvență; - siguranțe automate diferențiale pentru circuitele de iluminat și încălzire; - releu supraveghere faze (subtensiune, succesiune faze, supratensiune, lipsă fază); - ventilator interior de tablou cu funcționare termostată; - priză 230 Vc.a. monofazată și 400 Vc.a. trifazată pentru serviciile interne; - modul de protecție la supratensiuni atmosferice și de comutație. Pentru iluminatul stației de pompare se vor utiliza lămpi cu LED, alb neutru, 230 Vc.a., IP65, IK08, după cum urmează: - în zona tehnologică: min 30 W, 3500 lm, 4000 K, 2 buc.; - în birou: min 24 W, 2900 lm, 4000 K, 1 buc.; - în toaletă: min 18 W, 2100 lm, 4000 K, 1 buc. <i>Grup de pompare</i> Grupul de pompare se va monta în zona tehnologică, va fi de tipul 2A + 1R, Qpompa = 12,60 m³ /h, H = 100 mCA, cu electropompe verticale multietajate pentru apă potabilă, în construcție integrală din inox AISI 304, motor electric standardizat cu eficiență premium IE3, P = 5,50 kW, U = 400 Vc.a., clasa de izolație F, clasa de protecție IP55, senzori PTC, indice de eficiență hidraulică MEI > 0,7, rotoare hidraulice construite pentru reducerea împingerii axiale de tip „Shurricane”, etanșare mecanică cu schimbare rapidă, etanșări de tip o-ring din EPDM. Grupul de pompare se va realiza din țevă din oțel inoxidabil. Pe distribuitorul și colectorul grupului de pompare se vor prevedea senzori de presiune 0÷16 bar, 4÷20 mA și manometre 0÷16 bar, din inox, diametru 100 mm, cu glicerină. Pe aspirația grupului de pompare va fi prevăzut un vas închis, cu membrană, Pn 10, 1000 litri, iar pe refularea grupului de pompare va fi prevăzut un vas închis, cu membrană, Pn 16, 200 litri. Alimentarea grupului de pompare se face printr-o conductă de aspirație, Dn 100, Refularea grupului de pompare va fi conectată la o conductă, Dn 100. Pe conductă de refulare va fi prevăzut un debitmetru Dn 100, cu următoarele caracteristici: - principiul de măsurare: inducție electromagnetică; - conectarea la proces: flanșă EN 1092-1; - grad de protecție: IP 67; - carcasă și flanșe: oțel carbon, acoperire anticorozivă cu vopsea epoxidică (min. 150 μm); - țevă de măsură: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmițor, montaj compact, precizie de măsurare ± 0,4 %, o ieșire analogică 4÷20mA, o ieșire digitală, o ieșire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C.	Tabloul electric va fi prevăzut cu: - inversor manual de sursă, pentru posibilitatea conectării unui grup generator portabil (în sursa 1 se va conecta alimentarea din rețeaua electrică, iar în sursa 2 se va conecta o fișă industrială trifazată (400 V), montată aparent pe peretele exterior al tabloului electric); - posibilitatea selectării modului de lucru: manual – 0 – automat; - echipamente pentru protecția și comanda pompelor din grupul de pompare; fiecare pompă va fi acționată prin câte un convertizor de frecvență; - siguranțe automate diferențiale pentru circuitele de iluminat și încălzire; - releu supraveghere faze (subtensiune, succesiune faze, supratensiune, lipsă fază); - ventilator interior de tablou cu funcționare termostată; - priză 230 Vc.a. monofazată și 400 Vc.a. trifazată pentru serviciile interne; - modul de protecție la supratensiuni atmosferice și de comutație. Pentru iluminatul stației de pompare se vor utiliza lămpi cu LED, alb neutru, 230 Vc.a., IP65, IK08, după cum urmează: - în zona tehnologică: min 30 W, 3500 lm, 4000 K, 2 buc.; - în birou: min 24 W, 2900 lm, 4000 K, 1 buc.; - în toaletă: min 18 W, 2100 lm, 4000 K, 1 buc. Grup de pompare Grupul de pompare se va monta în zona tehnologică, va fi de tipul 2A + 1R, Qpompa = 12,60 m³ /h, H = 100 mCA, cu electropompe verticale multietajate pentru apă potabilă, în construcție integrală din inox AISI 304, motor electric standardizat cu eficiență premium IE3, P = 5,50 kW, U = 400 Vc.a., clasa de izolație F, clasa de protecție IP55, senzori PTC, indice de eficiență hidraulică MEI > 0,7, Sistem hidraulic 2D/3D optimizat din punct de vedere al randamentului, sudat cu laser, cu optimizare a debitului și degazificării, etanșare mecanică cu schimbare rapidă, etanșări de tip o-ring din EPDM. Grupul de pompare se va realiza din țevă din oțel inoxidabil. Pe distribuitorul și colectorul grupului de pompare se vor prevedea senzori de presiune 0÷16 bar, 4÷20 mA și manometre 0÷16 bar, din inox, diametru 100 mm, cu glicerină. Pe aspirația grupului de pompare va fi prevăzut un vas închis, cu membrană, Pn 10, 1000 litri, iar pe refularea grupului de pompare va fi prevăzut un vas închis, cu membrană, Pn 16, 200 litri. Alimentarea grupului de pompare se face printr-o conductă de aspirație, Dn 100, Refularea grupului de pompare va fi conectată la o conductă, Dn 100. Pe conductă de refulare va fi prevăzut un debitmetru Dn 100, cu următoarele caracteristici: - principiul de măsurare: inducție
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<i>Echipamente de automatizare</i> Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum și pentru comunicația cu sistemul SCADA, în tabloul electric și de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe ușa tabloului electric va fi amplasat un afișaj pentru urmărirea parametrilor procesului de către operator, precum și pentru programarea valorilor de referință. Tabloul electric și de automatizare trebuie să asigure controlul automat al funcționării pompelor, cu posibilitatea rotirii pompelor la 24, 48 sau 168 de ore. <i>Comunicare cu dispeceratul SCADA</i> Tabloul electric și de automatizare va prelua datele din stația de pompare și va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA “APA CANAL” LEOVA. Date transmise în dispeceratul SCADA vor fi, fără a se limita la această listă, următoarele: - starea de funcționare a fiecărei pompe din grupul de pompare (oprit, pornit, avarie); - parametrii electrici ai stației de pompare; - debitele instantanee și totalizatoarele de pe cele două conducte de refulare; - presiunile de pe aspirația și refularea grupului de pompare; - numărul orelor de funcționare pentru fiecare pompă; - prezența tensiunii de alimentare; - starea comunicației GPRS; Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatilă retentivă: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consumul tipic de curent: 210 mA; - current maxim consumat: 860 mA (360 mA – comunicație + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportată: max. 4096 Bit (INTERBUS); - numărul de dispozitive suportate: max. 128; - numărul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - opțiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antenă SMA; - grad de protecție: IP20; - temperatură ambientală operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umiditate permisă operare/transport-depozitare: 10 ÷ 95 %;	electromagnetică; - conectarea la proces: flanșa EN 1092-1; - grad de protecție: IP 67; - carcasă și flanșe: oțel carbon, acoperire anticorozivă cu vopsea epoxidică (min. 150 μm); - țeavă de măsură: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmițător, montaj compact, precizie de măsurare ± 0,4 %, o ieșire analogică 4÷20mA, o ieșire digitală, o ieșire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C. Echipamente de automatizare Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum și pentru comunicația cu sistemul SCADA, în tabloul electric și de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe ușa tabloului electric va fi amplasat un afișaj pentru urmărirea parametrilor procesului de către operator, precum și pentru programarea valorilor de referință. Tabloul electric și de automatizare trebuie să asigure controlul automat al funcționării pompelor, cu posibilitatea rotirii pompelor la 24, 48 sau 168 de ore. Comunicare cu dispeceratul SCADA Tabloul electric și de automatizare va prelua datele din stația de pompare și va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA “APA CANAL” LEOVA. Date transmise în dispeceratul SCADA vor fi, fără a se limita la această listă, următoarele: - starea de funcționare a fiecărei pompe din grupul de pompare (oprit, pornit, avarie); - parametrii electrici ai stației de pompare; - debitele instantanee și totalizatoarele de pe cele două conducte de refulare; - presiunile de pe aspirația și refularea grupului de pompare; - numărul orelor de funcționare pentru fiecare pompă; - prezența tensiunii de alimentare; - starea comunicației GPRS; Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatilă retentivă: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.);	
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	- presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului mării); - port pentru card SD (max. 2 GB); - webserver integrat. - 16 intrări digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) și 4 ieșiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate; Panou operator: - diagonală: minim 17,8 cm/7“; - rezoluție: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - număr culori: 262144 - procesor: 454 MHz; - sistem de operare: MS Windows® CE 6.0; - memorie RAM: 128 MB SDRAM; - interfață: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. ±15%; - curent consumat: 0,4 A; - grad de protecție: IP 66 (față), IP 20 (spate); - temperatura ambientală operare/depozitare-transport: 0 ÷ 50 °C / -20 ÷ +85 °C; - umiditate permisă operare/transport-depozitare: 10 ÷ 95 %.	- consumul tipic de curent: 210 mA; - curent maxim consumat: 860 mA (360 mA – comunicație + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportată: max. 4096 Bit (INTERBUS); - numărul de dispozitive suportate: max. 128; - numărul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - opțiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antenă SMA; - grad de protecție: IP20; - temperatură ambientală operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umiditate permisă operare/transport-depozitare: 10 ÷ 95 %; - presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului mării); - port pentru card SD (max. 2 GB); - webserver integrat. - 16 intrări digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) și 4 ieșiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate; Panou operator: - diagonală: minim 17,8 cm/7“; - rezoluție: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - număr culori: 262144 - procesor: 454 MHz; - sistem de operare: MS Windows® CE 6.0; - memorie RAM: 128 MB SDRAM; - interfață: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. ±15%; - curent consumat: 0,4 A; - grad de protecție: IP 66 (față), IP 20 (spate); - temperatura ambientală operare/depozitare-transport: 0 ÷ 50 °C / -20 ÷ +85 °C; umiditate permisă operare/transport-depozitare: 10 ÷ 95 %. Specificații de performanță și condiții privind siguranța în exploatare. - Respectarea condițiilor de temperatura: -20 □ 60□C; - Amplasare: rețea distribuție apă potabilă - Lichid de lucru: Apă potabilă	
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		Montarea se va face conform instructiunilor de montare date de producator.	
2	Specificații de performanță și condiții privind siguranța în exploatare. -Respectarea condițiilor de temperatura: -20 □ 60□C; - Amplasare: rețea distributie apa potabila - Lichid de lucru: Apă potabilă Montarea se va face conform instructiunilor de montare date de producator.	Specificații de performanță și condiții privind siguranța în exploatare. -Condiții de temperatura: -20 - + 60grade Celsius C; - Amplasare: rețea distributie apa potabila - Lichid de lucru: Apă potabilă	
3	Conditii de garantie si post-garantie: - 12 luni de functionare, dar nu mai mult de 18 luni de la livrare - Furnizorul va asigura pe baza de contract separat piese de schimb pe minim 10 ani	Conditii de garantie si post-garantie: - 12 luni de functionare, dar nu mai mult de 18 luni de la livrare - Va fi asigurat pe baza de contract separat piese de schimb pe minim 10 ani	

Data completarii: 12.12.2022

Semnat: _____

Nume: Comanac Ion

Functia in cadrul firmei: Director

Denumirea ofertant : Laiola SRL

Utilajul, echipamentul tehnologic: Stație de clorinare containerizată cu un sistem de clorinare Platforma B (s.Voinescu)

Nr. crt.	Specificații tehnice impuse prin caietul de sarcini	Corespondența propunerii tehnice cu specificațiile tehnice impuse prin caietul de sarcini	Producatorul
1	Parametri tehnici si functionali Container Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi amplasata intr-un container, cu o singura incapere, cu dimensiunile 3500 x 2400 x 2700 mm, cu stilpi de sustinere profilati la rece din tabla zincata cu grosimea de min 2 mm, pereti din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperis cu rezistenta portanta de min 250 kg/m2, format din structura metalica zincata profilata la rece, grunduita reactiv si vopsita, tabla zincata dublu faltuita, grosime min 0,5 mm, folie anticondens, vata minerala grosime min 100 mm norma C1, tavan PVC RAL 9002. Accesul in container se va realiza printr-o usa laterala cu dimensiunile 900x2000 mm, PVC/metallica. Instalatii climatizare Containerul va fi incalzit utilizind un convactor electric cu termostat cu puterea de min 2000 W, cu montare pe perete. Pentru prevenirea aparitiei condensului si a supraincalzirii, va fi prevazut un ventilator axial, cu montare murala, cu functionare temporizata, cu debitul de min 1300 m3/h, 230 Va.c., max 60 W. Grila de admisie a aerului in zona tehnologica va fi montata in jumatatea inferioara a usii de acces sau pe peretele opus peretelui pe care se monteaza ventilatorul. Instalatii electrice Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi prevazuta cu un singur tablou electric si de automatizare si control al procesului, cu dimensiunile max 800 x 260 x 600 mm.. Tabloul electric va fi prevazut cu: - inversor manual de sursa, pentru posibilitatea conectarii unui grup generator portabil (in sursa 1 se va conecta alimentarea din reseaua electrica, iar in sursa 2 se va conecta o fisa industriala monofazata (230 V), montata aparent pe peretele exterior al tabloului electric); - echipamente pentru protectia si comanda dozatoarelor de hipoclorit; - echipamente de protectie pentru debitmetre; - sigurante automate diferentiale pentru circuitele de iluminat si incalzire; - priza 230 Vc.a. monofazata pentru serviciile interne; - modul de protectie la supratensiuni atmosferice si de comutatie; Pentru iluminatul statiei de clorinare se va utiliza o lampa cu LED, max 30 W, 3500 lm, 4000 K, 230 Vc.a., IP65, IK08.	Parametri tehnici si functionali Container Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi amplasata intr-un container, cu o singura incapere, cu dimensiunile 3500 x 2400 x 2700 mm, cu stilpi de sustinere profilati la rece din tabla zincata cu grosimea de min 2 mm, pereti din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperis cu rezistenta portanta de min 250 kg/m2, format din structura metalica zincata profilata la rece, grunduita reactiv si vopsita, tabla zincata dublu faltuita, grosime min 0,5 mm, folie anticondens, vata minerala grosime min 100 mm norma C1, tavan PVC RAL 9002. Accesul in container se va realiza printr-o usa laterala cu dimensiunile 900x2000 mm, PVC/metallica. Instalatii climatizare Containerul va fi incalzit utilizind un convactor electric cu termostat cu puterea de min 2000 W sau un conditioner tip Airwell, cu montare pe perete. Pentru prevenirea aparitiei condensului si a supraincalzirii, va fi prevazut un ventilator axial, cu montare murala, cu functionare temporizata, cu debitul de min 1300 m3/h, 230 Va.c., max 60 W. Grila de admisie a aerului in zona tehnologica va fi montata in jumatatea inferioara a usii de acces sau pe peretele opus peretelui pe care se monteaza ventilatorul. Instalatii electrice Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi prevazuta cu un singur tablou electric si de automatizare si control al procesului, cu dimensiunile 800 x 260 x 600 mm.. Tabloul electric va fi prevazut cu: - inversor manual de sursa, pentru posibilitatea conectarii unui grup generator portabil (in sursa 1 se va conecta alimentarea din reseaua electrica, iar in sursa 2 se va conecta o fisa industriala monofazata (230 V), montata aparent pe peretele exterior al tabloului electric); - echipamente pentru protectia si comanda dozatoarelor de hipoclorit; - echipamente de protectie pentru debitmetre; - sigurante automate diferentiale pentru circuitele de iluminat si incalzire; - priza 230 Vc.a. monofazata pentru serviciile interne;	

Instalatii tehnologice Se va instala o linie de masurare a debitului si de injectie a hipocloritului, care va fi prevazuta cu urmatoarele echipamente: - robinet de izolare la intrare; - debitmetru (cu tronsoanele amonte si aval necesare); - sistem de analiza clor rezidual in timp real; - sistem de dozare hipoclorit; - robinet actionat electric la iesirea liniei controlat de senzori de nivel din cadrul castelului de apa potabila; - senzorii de nicel (min 3 buc.); - lavoar total echipat pentru spalare ochi in caz de incident; - sifon de pardoseala. Linia de masura se va realiza utilizind conducte din otel inoxidabil. Caracteristici statii de dezinfectie a apei cu hipoclorit de sodiu localitatea Voinescu: ☐ dimensiuni container: 3500 x 2400 x 2700; ☐ diametru intrare: Dn65 (PEHD De75); ☐ diametru iesire: Dn65 (PEHD De75); ☐ debitmetru: Dn50. Masurarea debitelor Caracteristici debitmetru: - principiul de masurare: inductie electromagnetica; - conectarea la proces: flansa EN 1092-1; - grad de protectie: IP 67; - carcasa si flanse: otel carbon, acoperire anticoroziune cu vopsea epoxidica (min. 150 µm); - teava de masura: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmiter, montaj compact, precizie de masurare ± 0,4 %, o iesire analogica 4÷20mA, o iesire digitala, o iesire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C. Corectia concentratiei de clor in apa In statia de dezinfectie a apei cu hipoclorit de sodiu se va face o corectie a concentratiei de clor din apa in functie de concentratia de clor din conducta de aspiratie si debitul vehiculat. Caracteristici sistem analiza clor rezidual:	- modul de protectie la supratensiuni atmosferice si de comutatie; Pentru iluminatul statiei de clorinare se va utiliza o lampa cu LED, max 30 W, 3500 lm, 4000 K, 230 Vc.a., IP65, IK08. Instalatii tehnologice Se va instala o linie de masurare a debitului si de injectie a hipocloritului, care va fi prevazuta cu urmatoarele echipamente: - robinet de izolare la intrare; - debitmetru (cu tronsoanele amonte si aval necesare); - sistem de analiza clor rezidual in timp real; - sistem de dozare hipoclorit; - robinet actionat electric la iesirea liniei controlat de senzori de nivel din cadrul castelului de apa potabila; - senzorii de nicel (min 3 buc.); - lavoar total echipat pentru spalare ochi in caz de incident; - sifon de pardoseala. Linia de masura se va realiza utilizind conducte din otel inoxidabil. Caracteristici statii de dezinfectie a apei cu hipoclorit de sodiu localitatea Voinescu: ☐ dimensiuni container: 3500 x 2400 x 2700; ☐ diametru intrare: Dn65 (PEHD De75); ☐ diametru iesire: Dn65 (PEHD De75); ☐ debitmetru: Dn50. Masurarea debitelor Caracteristici debitmetru: - principiul de masurare: inductie electromagnetica; - conectarea la proces: flansa EN 1092-1; - grad de protectie: IP 67; - carcasa si flanse: otel carbon, acoperire anticoroziune cu vopsea epoxidica (min. 150 µm); - teava de masura: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmiter, montaj compact, precizie de masurare ± 0,4 %, o iesire analogica 4÷20mA, o iesire digitala, o iesire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C. Corectia concentratiei de clor in apa	Prominent
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- alimentare: 220 Vc.a.; - sistem preasamblat al unitatii de control si al celei de masura (instalare pe perete); - sistem de prelevare a probei de apa pentru analiza concentratiei de clor rezidual; - masurarea si controlul continuu a concentratiei clorului rezidual, cu posibilitatea de compensare a temperaturii; - gama de masura a clorului rezidual: 0÷2 mg/l; - senzor de temperatura a apei; - presiune maxima de lucru: 3 bar. Sistem de dozare: se va instala un sistem de dozare pe conducta de refulare. Componenta sistem de dozare: - pompa dozatoare digitala, cu functionare automata in functie de debitul apei pompate si de valoarea clorului rezidual masurata de instalatia de analiza; - dozatorul va avea intrari si iesiri digitale (pentru comanda si citire stare pompa dozatoare), precum si intrari si iesiri analogice, 4÷20mA (pentru prescrierea referintei, respectiv, citirea reactiei dozatorului de clor); - rezervor de stocare solutie de hipoclorit, min 200 litri, material PE, prevazut cu robinet de golire; - agitator manual; - linie de aspiratie rigida, cu: sorb aspiratie, clapeta de sens si senzor de rezervor gol; - supapa multifunctionala, pentru: prevenirea sifonarii, mentinerea constanta a contrapresiunii si reducerea manuala a presiunii; - furtun dozare hipoclorit; - unitate de injectie hipoclorit, cu supapa pentru prevenirea cristalizarii si blocarii dozarii hipocloritului in apa care are un continut ridicat de carbonati. Caracteristici pompa dozatoare: - alimentare: 220 Vc.a.; - debit maxim 7,5 l/h si debit minim 2,5 ml/h; - presiune de lucru: max. 16 bari; - meniu de lucru in limba romana; - afisaj LCD, cu iluminarea fundalului in culori specifice starii de functionare; - sistem de auto-dezaerare; - sistem de auto-adaptare; - senzor de monitorizare a presiunii; - afisare informatii de service; - relee de iesire semnal (programabile); - suport (placa) de montaj inclusa; - modul de interfatare comunicatie SCADA (Modbus-RTU TCP, Profinet).	In statia de dezinfectie a apei cu hipoclorit de sodiu se va face o corectie a concentratiei de clor din apa in functie de concentratia de clor din conducta de aspiratie si debitul vehiculat. Caracteristici sistem analiza clor rezidual: - alimentare: 220 Vc.a.; - sistem preasamblat al unitatii de control si al celei de masura (instalare pe perete); - sistem de prelevare a probei de apa pentru analiza concentratiei de clor rezidual; - masurarea si controlul continuu a concentratiei clorului rezidual, cu posibilitatea de compensare a temperaturii; - gama de masura a clorului rezidual: 0÷2 mg/l; - senzor de temperatura a apei; - presiune maxima de lucru: 3 bar. Sistem de dozare: se va instala un sistem de dozare pe conducta de refulare. Componenta sistem de dozare: - pompa dozatoare digitala, cu functionare automata in functie de debitul apei pompate si de valoarea clorului rezidual masurata de instalatia de analiza; - dozatorul va avea intrari si iesiri digitale (pentru comanda si citire stare pompa dozatoare), precum si intrari si iesiri analogice, 4÷20mA (pentru prescrierea referintei, respectiv, citirea reactiei dozatorului de clor); - rezervor de stocare solutie de hipoclorit, min 200 litri, material PE, prevazut cu robinet de golire; - agitator manual; - linie de aspiratie rigida, cu: sorb aspiratie, clapeta de sens si senzor de rezervor gol; - supapa multifunctionala, pentru: prevenirea sifonarii, mentinerea constanta a contrapresiunii si reducerea manuala a presiunii; - furtun dozare hipoclorit; - unitate de injectie hipoclorit, cu supapa pentru prevenirea cristalizarii si blocarii dozarii hipocloritului in apa care are un continut ridicat de carbonati. Caracteristici pompa dozatoare: - alimentare: 220 Vc.a.; - debit maxim 7,5 l/h si debit minim 2,5 ml/h; - presiune de lucru: max. 16 bari; - meniu de lucru in limba romana;	
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	Echipamente de automatizare Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum si pentru comunicatia cu sistemul SCADA, in tabloul electric si de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe usa tabloului electric va fi amplasat un afisaj pentru urmarirea parametrilor procesului de catre operator, precum si pentru programarea valorilor de referinta. Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatila retentiva: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consumul tipic de curent: 210 mA; - curent maxim consumat: 860 mA (360 mA – comunicatie + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportata: max. 4096 Bit (INTERBUS); - numarul de dispozitive suportate: max. 128; - numarul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - optiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antena SMA; - grad de protectie: IP20; - temperatura ambientala operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umeditate permisa operare/transport-depozitare: 10 ÷ 95 %; - presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului marii); - port pentru card SD (max. 2 GB); - webserver integrat; - 16 intrari digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) si 4 iesiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate. Modul cu 8 intrari digitale: - alimentare: 19,2÷30 Vc.c.); - consum curent: max. 30 mA; - consum putere: max. 0,25 W; - LED-uri semnalizare stare intrari; - timp tipic de raspuns: 1 ms;	- afisaj LCD, cu iluminarea fundalului in culori specifice starii de functionare; - sistem de auto-dezaerare; - sistem de auto-adaptare; - senzor de monitorizare a presiunii; - afisare informatii de service; - relee de iesire semnal (programabile); - suport (placa) de montaj inclusa; - modul de interfatare comunicatie SCADA (Modbus-RTU TCP, Profinet). Echipamente de automatizare Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum si pentru comunicatia cu sistemul SCADA, in tabloul electric si de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe usa tabloului electric va fi amplasat un afisaj pentru urmarirea parametrilor procesului de catre operator, precum si pentru programarea valorilor de referinta. Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatila retentiva: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consumul tipic de curent: 210 mA; - curent maxim consumat: 860 mA (360 mA – comunicatie + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportata: max. 4096 Bit (INTERBUS); - numarul de dispozitive suportate: max. 128; - numarul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - optiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antena SMA; - grad de protectie: IP20; - temperatura ambientala operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umeditate permisa operare/transport-depozitare: 10 ÷ 95 %; - presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului marii);	AXIMA
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- tensiune de intrare pentru semnal „0”: $-3 \div +5$ Vc.c.; - tensiune de intrare pentru semnal „1”: $11 \div 30$ Vc.c. Modul cu 8 iesiri digitale: - sarcina inductiva nominala: 12 VA (1,2 H; 50 Ω); - sarcina rezistiva nominala: 12 W (48 Ω); - curentul maxim de iesire per canal: 500 mA; - tensiune de iesire: 24 Vc.c.; - protectie la suprasarcina si scurtcircuit; - tensiune de alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consum de curent: max. 45 mA; - consum de putere: max. 0,34 W; - LED-uri semnalizare stare iesiri. Modul cu 4 intrari analogice in curent (0/4 ÷ 20 mA): - timp de conversie analogic/digital: max. 6,5 μs; - rezolutie analogic/digital: 12 bit; - consum curent: 55 mA; Panou operator: - diagonala: minim 17,8 cm/7”; - rezolutie: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - numar culori: 262144 - procesor: 454 MHz; - sistem de operare: MS Windows® CE 6.0; - memorie RAM: 128 MB SDRAM; - interfata: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. $\pm 15\%$; - curent consumat: 0,4 A; - grad de protectie: IP 66 (fata), IP 20 (spate); - temperatura ambientala operare/depozitare-transport: $0 \div 50$ °C / $-20 \div +85$ °C; - umiditate permisa operare/transport-depozitare: $10 \div 95$ %. Sursa cu UPS integrat: - tensiune de intrare: $85 \div 264$ Vc.a. / $100 \div 350$ Vc.a.;	- port pentru card SD (max. 2 GB); - webserver integrat; - 16 intrari digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) si 4 iesiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate. Modul cu 8 intrari digitale: - alimentare: 19,2÷30 Vc.c.); - consum curent: max. 30 mA; - consum putere: max. 0,25 W; - LED-uri semnalizare stare intrari; - timp tipic de raspuns: 1 ms; - tensiune de intrare pentru semnal „0”: $-3 \div +5$ Vc.c.; - tensiune de intrare pentru semnal „1”: $11 \div 30$ Vc.c. Modul cu 8 iesiri digitale: - sarcina inductiva nominala: 12 VA (1,2 H; 50 Ω); - sarcina rezistiva nominala: 12 W (48 Ω); - curentul maxim de iesire per canal: 500 mA; - tensiune de iesire: 24 Vc.c.; - protectie la suprasarcina si scurtcircuit; - tensiune de alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consum de curent: max. 45 mA; - consum de putere: max. 0,34 W; - LED-uri semnalizare stare iesiri. Modul cu 4 intrari analogice in curent (0/4 ÷ 20 mA): - timp de conversie analogic/digital: max. 6,5 μs; - rezolutie analogic/digital: 12 bit; - consum curent: 55 mA; Panou operator: - diagonala: minim 17,8 cm/7”; - rezolutie: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - numar culori: 262144 - procesor: 454 MHz;	
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- consum curent: 1,8 A la 230 Vc.a. / 1,8 A la 120 Vc.a.; - factor de putere: aprox. 0,5 - curent limita de pornire in sarcina/I_{2t}: < 1,3 A_{2s}; - timp tipic de raspuns: 150 ms (230 Vc.a.) / 200 ms (120 Vc.a.); - circuit de protectie: varistor integrat pentru protectia la regim tranzitoriu; - siguranta intrare: 6,3 A, integrate; - tensiune nominala de iesire: 24 Vc.c.; - curent nominal de iesire: 5 A (-25 ÷ 55°C); - curent maxim de iesire: 6 A; - scadere curent de iesire cu temperatura: 2,5%/K pentru 55 ÷ 70 °C; - eficienta: > 88 % (230 Vc.a., alimentare din retea); > 86 % (120 Vc.a., alimentare din retea); > 86 % (alimentare din baterie); - component alternativ in curentul de iesire: < 10 mVPP; - conectare in paralel: da, 2 dispozitive; - baterii externe acceptate: 1,3 Ah / 3,4 Ah / 7,2 Ah / 12 Ah; - caracteristica de incarcare: curba caracteristica I/U; - curent de incarcare: 0,2 A ÷ 1,5 A (implicit 1,0 A); - compensarea temperaturii: 0 ÷ 200 mV/K (implicit 42 mV/K); - interval verificare baterie: 4 h ÷ 200 h (implicit 12 h); - montaj: sina DIN; - MTBF (IEC 61709, SN 29500): > 596000 h (40 °C); - compatibilitate electromagnetica: in conformitate cu directive EMC 2004/108/EC; - emisie zgomot: EN 55011 (EN 55022); - directiva joasa tensiune: 2006/95/EC; - clasa de protectie: I; - grad de protectie: IP20; - temperatura ambientala operare: -25 ÷ +70 °C; - umiditate permisa operare: 95 % (la 20 °C, fara condens). Contor de energie - temperatura ambientala operare: -10 ÷ +55 °C; - umiditate permisa operare: 80 % (pina la 31 °C); - grad de protectie: IP52 (fata), IP30 (spate); - afisaj: LCD, iluminat; - tensiune de alimentare: 110 ÷ 400 Vc.a. ± 10 %; - putere nominala consumata: 5 VA; - putere maxima consumata cu toate modulele de extensie: 10 VA; - conformitate: CE; - principiul de masurare: valoare R.M.S;	- sistem de operare: MS Windows® CE 6.0; - memorie RAM: 128 MB SDRAM; - interfata: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. ±15%; - curent consumat: 0,4 A; - grad de protectie: IP 66 (fata), IP 20 (spate); - temperatura ambientala operare/depozitare-transport: 0 ÷ 50 °C / -20 ÷ +85 °C; - umiditate permisa operare/transport-depozitare: 10 ÷ 95 %. Sursa cu UPS integrat: - tensiune de intrare: 85 ÷ 264 Vc.a. / 100 ÷ 350 Vc.a.; - consum curent: 1,8 A la 230 Vc.a. / 1,8 A la 120 Vc.a.; - factor de putere: aprox. 0,5 - curent limita de pornire in sarcina/I_{2t}: < 1,3 A_{2s}; - timp tipic de raspuns: 150 ms (230 Vc.a.) / 200 ms (120 Vc.a.); - circuit de protectie: varistor integrat pentru protectia la regim tranzitoriu; - siguranta intrare: 6,3 A, integrate; - tensiune nominala de iesire: 24 Vc.c.; - curent nominal de iesire: 5 A (-25 ÷ 55°C); - curent maxim de iesire: 6 A; - scadere curent de iesire cu temperatura: 2,5%/K pentru 55 ÷ 70 °C; - eficienta: > 88 % (230 Vc.a., alimentare din retea); > 86 % (120 Vc.a., alimentare din retea); > 86 % (alimentare din baterie); - component alternativ in curentul de iesire: < 10 mVPP; - conectare in paralel: da, 2 dispozitive; - baterii externe acceptate: 1,3 Ah / 3,4 Ah / 7,2 Ah / 12 Ah; - caracteristica de incarcare: curba caracteristica I/U; - curent de incarcare: 0,2 A ÷ 1,5 A (implicit 1,0 A); - compensarea temperaturii: 0 ÷ 200 mV/K (implicit 42 mV/K); - interval verificare baterie: 4 h ÷ 200 h (implicit 12 h); - montaj: sina DIN; - MTBF (IEC 61709, SN 29500): > 596000 h (40 °C); - compatibilitate electromagnetica: in conformitate cu directive EMC 2004/108/EC; - emisie zgomot: EN 55011 (EN 55022); - directiva joasa tensiune: 2006/95/EC; - clasa de protectie: I;	
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	- armonici: pina la armonica 51; - precizie: 0,2%; - domeniul de masura: 50 ÷ 500 Vc.a. (faza/faza), 28 ÷ 289 Vc.a. (faza/neutru); - frecventa: 50 ÷ 60 Hz; - masurarea se realizeaza cu transformatoare externe; - energie activa (IEC 62053-22): clasa 0,5 S; - putere reactiva (IEC 62053-23): clasa 2; - modul de comunicare: RS 485. Comunicare cu dispeceratul SCADA Tabloul electric si de automatizare va prelua datele din statia de clorinare si va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA „APA CANAL” LEOVA. Date transmise in dispeceratul SCADA vor fi, fara a se limita la aceasta lista, urmatoarele: - starea de functionare a analizorului de clor si a sistemului de dozare; - parametrii electrici ai statiei de dezinfectie a apei cu hipoclorit de sodiu; - debitul instantaneu si totalizatorul de pe linia de dezinfectie a apei cu hipoclorit de sodiu; - prezenta tensiunii de alimentare; - starea comunicatiei GPRS; - regim statie de dezinfectie a apei cu hipoclorit de sodiu; - cantitate de clor/puls programata; - concentratie de clor programata; - alarma nivel scazut hipoclorit in rezervor; - alarma sisteme de dezinfectie a apei cu hipoclorit de sodiu; - volum de clor dozat; - numar de porniri ale pompei dozatoare de clor; - orele de functionare ale pompei dozatoare de clor; - temperatura apei.	- grad de protectie: IP20; - temperatura ambientala operare: -25 ÷ +70 °C; - umiditate permisa operare: 95 % (la 20 °C, fara condens). Contor de energie - temperatura ambientala operare: -10 ÷ +55 °C; - umiditate permisa operare: 80 % (pina la 31 °C); - grad de protectie: IP52 (fata), IP30 (spate); - afisaj: LCD, iluminat; - tensiune de alimentare: 110 ÷ 400 Vc.a. ± 10 %; - putere nominala consumata: 5 VA; - putere maxima consumata cu toate modulele de extensie: 10 VA; - conformitate: CE; - principiul de masurare: valoare R.M.S; - armonici: pina la armonica 51; - precizie: 0,2%; - domeniul de masura: 50 ÷ 500 Vc.a. (faza/faza), 28 ÷ 289 Vc.a. (faza/neutru); - frecventa: 50 ÷ 60 Hz; - masurarea se realizeaza cu transformatoare externe; - energie activa (IEC 62053-22): clasa 0,5 S; - putere reactiva (IEC 62053-23): clasa 2; - modul de comunicare: RS 485. Comunicare cu dispeceratul SCADA Tabloul electric si de automatizare va prelua datele din statia de clorinare si va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA „APA CANAL” LEOVA. Date transmise in dispeceratul SCADA vor fi, fara a se limita la aceasta lista, urmatoarele: - starea de functionare a analizorului de clor si a sistemului de dozare; - parametrii electrici ai statiei de dezinfectie a apei cu hipoclorit de sodiu; - debitul instantaneu si totalizatorul de pe linia de dezinfectie a apei cu hipoclorit de sodiu; - prezenta tensiunii de alimentare; - starea comunicatiei GPRS; - regim statie de dezinfectie a apei cu hipoclorit de sodiu; - cantitate de clor/puls programata; - concentratie de clor programata; - alarma nivel scazut hipoclorit in rezervor; - alarma sisteme de dezinfectie a apei cu hipoclorit de sodiu; - volum de clor dozat;	
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		- numar de porniri ale pompei dozatoare de clor; - orele de functionare ale pompei dozatoare de clor; - temperatura apei.	
2	Specificatii de performanta si conditii privind siguranta in exploatare. - Respectarea conditiilor de temperatura: -20 – 60 grade C; - Amplasare: retea distributie apa potabila; - Lichid de lucru: apa potabila; Montarea se va face conform instructiunilor de montare date de producator.	Specificatii de performanta si conditii privind siguranta in exploatare. - Temperatura: -20 – 60 grade C; - Amplasare: retea distributie apa potabila; - Lichid de lucru: apa potabila; Montarea se va face conform instructiunilor de montare date de producator.	-
3	Conditii de garantie si postgarantie Min 24 luni garantie de la punerea in functiune. Se vor asigura piese de schimb si service specializat in garantie si post garantie. Piese de schimb in post garantie pe o perioada de 10 ani.	Conditii de garantie si postgarantie -24 luni garantie de la punerea in functiune. Se vor asigura piese de schimb si service specializat in garantie si post garantie. Piese de schimb in post garantie pe o perioada de 10 ani.	-
4	Alte conditii tehnice: Statia de dezinfectie a apei cu hipoclorit de sodiu va fi insotita de manual de exploatare, fise tehnice ale echipamentelor montate in proces si scheme electrice ale tabloului de automatizare.	Alte conditii tehnice: Statia de dezinfectie a apei cu hipoclorit de sodiu va fi insotita de manual de exploatare, fise tehnice ale echipamentelor montate in proces si scheme electrice ale tabloului de automatizare.	-

Data completarii: 12.12.2022

Semnat: _____

Nume: Comanac Ion

Functia in cadrul firmei: Director

Denumirea ofertant : Laiola SRL

Utilajul, echipamentul tehnologic: Stație de clorinare containerizată cu un sistem de clorinare Platforma C (s.Mingir)

Nr. crt.	Specificații tehnice impuse prin caietul de sarcini	Corespondența propunerii tehnice cu specificațiile tehnice impuse prin caietul de sarcini	Producatorul
1	Parametri tehnici si functionali Container Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi amplasata intr-un container, cu o singura incapere, cu dimensiunile 3500 x 2400 x 2700 mm, cu stilpi de sustinere profilati la rece din tabla zincata cu grosimea de min 2 mm, pereti din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperis cu rezistenta portanta de min 250 kg/m2, format din structura metalica zincata profilata la rece, grunduita reactiv si vopsita, tabla zincata dublu faltuita, grosime min 0,5 mm, folie anticondens, vata minerala grosime min 100 mm norma C1, tavan PVC RAL 9002. Accesul in container se va realiza printr-o usa laterala cu dimensiunile 900x2000 mm, PVC/metallica. Instalatii climatizare Containerul va fi incalzit utilizind un convectoz electric cu termostatz cu puterea de min 2000 W, cu montare pe perete. Pentru prevenirea aparitiei condensului si a supraincalzirii, va fi prevazut un ventilator axial, cu montare murala, cu functionare temporizata, cu debitul de min 1300 m3/h, 230 Va.c., max 60 W. Grila de admisie a aerului in zona tehnologica va fi montata in jumatatea inferioara a usii de acces sau pe peretele opus peretelui pe care se monteaza ventilatorul. Instalatii electrice Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi prevazuta cu un singur tablou electric si de automatizare si control al procesului, cu dimensiunile max 800 x 260 x 600 mm.. Tabloul electric va fi prevazut cu: - inversor manual de sursa, pentru posibilitatea conectarii unui grup generator portabil (in sursa 1 se va conecta alimentarea din reseaua electrica, iar in sursa 2 se va conecta o fisa industriala monofazata (230 V), montata aparent pe peretele exterior al tabloului electric); - echipamente pentru protectia si comanda dozatoarelor de hipoclorit; - echipamente de protectie pentru debitmetre; - sigurante automate diferentiale pentru circuitele de iluminat si incalzire; - priza 230 Vc.a. monofazata pentru serviciile interne; - modul de protectie la supratensiuni atmosferice si de comutatie; Pentru iluminatul statiei de clorinare se va utiliza o lampa cu LED, max 30 W,	Parametri tehnici si functionali Container Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi amplasata intr-un container, cu o singura incapere, cu dimensiunile 3500 x 2400 x 2700 mm, cu stilpi de sustinere profilati la rece din tabla zincata cu grosimea de min 2 mm, pereti din panou sandwich poliuretan tip C 1 RAL 9002 (garantat min 10 ani), acoperis cu rezistenta portanta de min 250 kg/m2, format din structura metalica zincata profilata la rece, grunduita reactiv si vopsita, tabla zincata dublu faltuita, grosime min 0,5 mm, folie anticondens, vata minerala grosime min 100 mm norma C1, tavan PVC RAL 9002. Accesul in container se va realiza printr-o usa laterala cu dimensiunile 900x2000 mm, PVC/metallica. Instalatii climatizare Containerul va fi incalzit utilizind un convectoz electric cu termostatz cu puterea de min 2000 W sau un conditioner tip Airwell, cu montare pe perete. Pentru prevenirea aparitiei condensului si a supraincalzirii, va fi prevazut un ventilator axial, cu montare murala, cu functionare temporizata, cu debitul de min 1300 m3/h, 230 Va.c., max 60 W. Grila de admisie a aerului in zona tehnologica va fi montata in jumatatea inferioara a usii de acces sau pe peretele opus peretelui pe care se monteaza ventilatorul. Instalatii electrice Statia de de dezinfectie a apei cu hipoclorit de sodiu va fi prevazuta cu un singur tablou electric si de automatizare si control al procesului, cu dimensiunile max 800 x 260 x 600 mm.. Tabloul electric va fi prevazut cu: - inversor manual de sursa, pentru posibilitatea conectarii unui grup generator portabil (in sursa 1 se va conecta alimentarea din reseaua electrica, iar in sursa 2 se va conecta o fisa industriala monofazata (230 V), montata aparent pe peretele exterior al tabloului electric); - echipamente pentru protectia si comanda dozatoarelor de hipoclorit; - echipamente de protectie pentru debitmetre; - sigurante automate diferentiale pentru circuitele de iluminat si incalzire; - priza 230 Vc.a. monofazata pentru serviciile interne; - modul de protectie la supratensiuni atmosferice si de comutatie;	

3500 lm, 4000 K, 230 Vc.a., IP65, IK08. Instalatii tehnologice Se va instala o linie de masurare a debitului si de injectie a hipocloritului, care va fi prevazuta cu urmatoarele echipamente: - robinet de izolare la intrare; - debitmetru (cu tronsoanele amonte si aval necesare); - sistem de analiza clor rezidual in timp real; - sistem de dozare hipoclorit; - robinet actionat electric la iesirea liniei controlat de senzori de nivel din cadrul castelului de apa potabila; - senzorii de nicel (min 3 buc.); - lavoar total echipat pentru spalare ochi in caz de incident; - sifon de pardoseala. Linia de masura se va realiza utilizind conducte din otel inoxidabil. Caracteristici statii de dezinfectie a apei cu hipoclorit de sodiu localitatea Mingir: ☐ dimensiuni container: 3500 x 2400 x 2700; ☐ diametru intrare: Dn100 (PEHD De110); ☐ diametru iesire: Dn100 (PEHD De110); ☐ debitmetru: Dn65. Masurarea debitelor Caracteristici debitmetru: - principiul de masurare: inductie electromagnetica; - conectarea la proces: flansa EN 1092-1; - grad de protectie: IP 67; - carcasa si flanse: otel carbon, acoperire anticoroziune cu vopsea epoxidica (min. 150 µm); - teava de masura: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmiter, montaj compact, precizie de masurare ± 0,4 %, o iesire analogica 4÷20mA, o iesire digitala, o iesire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C. Corectia concentratiei de clor in apa In statia de dezinfectie a apei cu hipoclorit de sodiu se va face o corectie a concentratiei de clor din apa in functie de concentratia de clor din conducta de aspiratie si debitul vehiculat.	Pentru iluminatul statiei de clorinare se va utiliza o lampa cu LED, max 30 W, 3500 lm, 4000 K, 230 Vc.a., IP65, IK08. Instalatii tehnologice Se va instala o linie de masurare a debitului si de injectie a hipocloritului, care va fi prevazuta cu urmatoarele echipamente: - robinet de izolare la intrare; - debitmetru (cu tronsoanele amonte si aval necesare); - sistem de analiza clor rezidual in timp real; - sistem de dozare hipoclorit; - robinet actionat electric la iesirea liniei controlat de senzori de nivel din cadrul castelului de apa potabila; - senzorii de nicel (min 3 buc.); - lavoar total echipat pentru spalare ochi in caz de incident; - sifon de pardoseala. Linia de masura se va realiza utilizind conducte din otel inoxidabil. Caracteristici statii de dezinfectie a apei cu hipoclorit de sodiu localitatea Mingir: ☐ dimensiuni container: 3500 x 2400 x 2700; ☐ diametru intrare: Dn100 (PEHD De110); ☐ diametru iesire: Dn100 (PEHD De110); ☐ debitmetru: Dn65. Masurarea debitelor Caracteristici debitmetru: - principiul de masurare: inductie electromagnetica; - conectarea la proces: flansa EN 1092-1; - grad de protectie: IP 67; - carcasa si flanse: otel carbon, acoperire anticoroziune cu vopsea epoxidica (min. 150 µm); - teava de masura: inox AISI 304/1.4301; - electrozi: hastelloy C; - transmiter, montaj compact, precizie de masurare ± 0,4 %, o iesire analogica 4÷20mA, o iesire digitala, o iesire pe releu, display retroiluminat cu text alfanumeric 3x20 caractere, IP67, alimentare 115-230 Vc.a., temperatura de operare -20÷50 °C. Corectia concentratiei de clor in apa	Prominent
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Caracteristici sistem analiza clor rezidual: - alimentare: 220 Vc.a.; - sistem preasamblat al unitatii de control si al celei de masura (instalare pe perete); - sistem de prelevare a probei de apa pentru analiza concentratiei de clor rezidual; - masurarea si controlul continuu a concentratiei clorului rezidual, cu posibilitatea de compensare a temperaturii; - gama de masura a clorului rezidual: 0÷2 mg/l; - senzor de temperatura a apei; - presiune maxima de lucru: 3 bar. Sistem de dozare: se va instala un sistem de dozare pe conducta de refulare. Componenta sistem de dozare: - pompa dozatoare digitala, cu functionare automata in functie de debitul apei pompate si de valoarea clorului rezidual masurata de instalatia de analiza; - dozatorul va avea intrari si iesiri digitale (pentru comanda si citire stare pompa dozatoare), precum si intrari si iesiri analogice, 4÷20mA (pentru prescrierea referintei, respectiv, citirea reactiei dozatorului de clor); - rezervor de stocare solutie de hipoclorit, min 200 litri, material PE, prevazut cu robinet de golire; - agitator manual; - linie de aspiratie rigida, cu: sorb aspiratie, clapeta de sens si senzor de rezervor gol; - supapa multifunctionala, pentru: prevenirea sifonarii, mentinerea constanta a contrapresiunii si reducerea manuala a presiunii; - furtun dozare hipoclorit; - unitate de injectie hipoclorit, cu supapa pentru prevenirea cristalizarii si blocarii dozarii hipocloritului in apa care are un continut ridicat de carbonati. Caracteristici pompa dozatoare: - alimentare: 220 Vc.a.; - debit maxim 7,5 l/h si debit minim 2,5 ml/h; - presiune de lucru: max. 16 bari; - meniu de lucru in limba romana; - afisaj LCD, cu iluminarea fundalului in culori specifice starii de functionare; - sistem de auto-dezaerare; - sistem de auto-adaptare; - senzor de monitorizare a presiunii; - afisare informatii de service; - relee de iesire semnal (programabile); - suport (placa) de montaj inclusa; - modul de interfatare comunicatie SCADA (Modbus-RTU TCP, Profinet).	In statia de dezinfectie a apei cu hipoclorit de sodiu se va face o corectie a concentratiei de clor din apa in functie de concentratia de clor din conducta de aspiratie si debitul vehiculat. Caracteristici sistem analiza clor rezidual: - alimentare: 220 Vc.a.; - sistem preasamblat al unitatii de control si al celei de masura (instalare pe perete); - sistem de prelevare a probei de apa pentru analiza concentratiei de clor rezidual; - masurarea si controlul continuu a concentratiei clorului rezidual, cu posibilitatea de compensare a temperaturii; - gama de masura a clorului rezidual: 0÷2 mg/l; - senzor de temperatura a apei; - presiune maxima de lucru: 3 bar. Sistem de dozare: se va instala un sistem de dozare pe conducta de refulare. Componenta sistem de dozare: - pompa dozatoare digitala, cu functionare automata in functie de debitul apei pompate si de valoarea clorului rezidual masurata de instalatia de analiza; - dozatorul va avea intrari si iesiri digitale (pentru comanda si citire stare pompa dozatoare), precum si intrari si iesiri analogice, 4÷20mA (pentru prescrierea referintei, respectiv, citirea reactiei dozatorului de clor); - rezervor de stocare solutie de hipoclorit, min 200 litri, material PE, prevazut cu robinet de golire; - agitator manual; - linie de aspiratie rigida, cu: sorb aspiratie, clapeta de sens si senzor de rezervor gol; - supapa multifunctionala, pentru: prevenirea sifonarii, mentinerea constanta a contrapresiunii si reducerea manuala a presiunii; - furtun dozare hipoclorit; - unitate de injectie hipoclorit, cu supapa pentru prevenirea cristalizarii si blocarii dozarii hipocloritului in apa care are un continut ridicat de carbonati. Caracteristici pompa dozatoare: - alimentare: 220 Vc.a.; - debit maxim 7,5 l/h si debit minim 2,5 ml/h; - presiune de lucru: max. 16 bari; - meniu de lucru in limba romana; - afisaj LCD, cu iluminarea fundalului in culori specifice starii de	
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Echipamente de automatizare Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum si pentru comunicatia cu sistemul SCADA, in tabloul electric si de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe usa tabloului electric va fi amplasat un afisaj pentru urmarirea parametrilor procesului de catre operator, precum si pentru programarea valorilor de referinta. Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatila retentiva: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consumul tipic de curent: 210 mA; - curent maxim consumat: 860 mA (360 mA – comunicatie + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportata: max. 4096 Bit (INTERBUS); - numarul de dispozitive suportate: max. 128; - numarul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - optiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antena SMA; - grad de protectie: IP20; - temperatura ambientala operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umeditate permisa operare/transport-depozitare: 10 ÷ 95 %; - presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului marii); - port pentru card SD (max. 2 GB); - webserver integrat; - 16 intrari digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) si 4 - iesiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate. - Modul cu 8 intrari digitale: - alimentare: 19,2÷30 Vc.c.); - consum curent: max. 30 mA; - consum putere: max. 0,25 W; - LED-uri semnalizare stare intrari;	functionare; - sistem de auto-dezaerare; - sistem de auto-adaptare; - senzor de monitorizare a presiunii; - afisare informatii de service; - relee de iesire semnal (programabile); - suport (placa) de montaj inclusa; - modul de interfatare comunicatie SCADA (Modbus-RTU TCP, Profinet). Echipamente de automatizare Pentru monitorizarea/controlul parametrilor procesului tehnologic, precum si pentru comunicatia cu sistemul SCADA, in tabloul electric si de automatizare se va prevedea un PLC cu router GSM/GPRS integrat. Pe usa tabloului electric va fi amplasat un afisaj pentru urmarirea parametrilor procesului de catre operator, precum si pentru programarea valorilor de referinta. Caracteristicile PLC-ului: - procesor: 64 MHz; - memorie program: 512 kByte; - memorie nevolatila retentiva: 48 kByte (NVRAM); - memorie de stocare: 512 kByte; - ceas de timp real; - alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consumul tipic de curent: 210 mA; - curent maxim consumat: 860 mA (360 mA – comunicatie + 500 mA – alimentare I/O analogice); - cantitatea de date de proces suportata: max. 4096 Bit (INTERBUS); - numarul de dispozitive suportate: max. 128; - numarul de dispozitive locale care pot fi conectate: max. 63; - limbaje de programare conform IEC 61631-3 (LD, FBD, ST, IL); - optiuni comunicare: Ethernet (10/100 Mbit/s), RS485, RS422; - router GSM/GPRS integrat, port card SIM, conexiune antena SMA; - grad de protectie: IP20; - temperatura ambientala operare/transport-depozitare: -25 ÷ +55 °C / -25 ÷ +85 °C; - umeditate permisa operare/transport-depozitare: 10 ÷ 95 %; - presiunea aerului: 70 ÷ 106 kPa (max. 3000 m deasupra nivelului marii); - port pentru card SD (max. 2 GB);	
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- timp tipic de raspuns: 1 ms; - tensiune de intrare pentru semnal „0”: -3 ÷ +5 Vc.c.; - tensiune de intrare pentru semnal „1”: 11 ÷ 30 Vc.c. Modul cu 8 iesiri digitale: - sarcina inductiva nominala: 12 VA (1,2 H; 50 Ω); - sarcina rezistiva nominala: 12 W (48 Ω); - curentul maxim de iesire per canal: 500 mA; - tensiune de iesire: 24 Vc.c.; - protectie la suprasarcina si scurtcircuit; - tensiune de alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consum de curent: max. 45 mA; - consum de putere: max. 0,34 W; - LED-uri semnalizare stare iesiri. Modul cu 4 intrari analogice in curent (0/4 ÷ 20 mA): - timp de conversie analogic/digital: max. 6,5 μs; - rezolutie analogic/digital: 12 bit; - consum curent: 55 mA; Panou operator: - diagonala: minim 17,8 cm/7“; - rezolutie: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - numar culori: 262144 - procesor: 454 MHz; - sistem de operare: MS Windows® CE 6.0; - memorie RAM: 128 MB SDRAM; - interfata: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. ±15%; - curent consumat: 0,4 A; - grad de protectie: IP 66 (fata), IP 20 (spate); - temperatura ambientala operare/depozitare-transport: 0 ÷ 50 °C / -20 ÷ +85 °C; - umiditate permisa operare/transport-depozitare: 10 ÷ 95 %. Sursa cu UPS integrat:	- webserver integrat; - 16 intrari digitale (conectare 2, 3, 4 conductoare, tip NPN/PNP EN 61131-2) si 4 iesiri digitale (conectare 2, 3, 4 conductoare, consum maxim pe canal 500 mA) integrate. Modul cu 8 intrari digitale: - alimentare: 19,2÷30 Vc.c.); - consum curent: max. 30 mA; - consum putere: max. 0,25 W; - LED-uri semnalizare stare intrari; - timp tipic de raspuns: 1 ms; - tensiune de intrare pentru semnal „0”: -3 ÷ +5 Vc.c.; - tensiune de intrare pentru semnal „1”: 11 ÷ 30 Vc.c. Modul cu 8 iesiri digitale: - sarcina inductiva nominala: 12 VA (1,2 H; 50 Ω); - sarcina rezistiva nominala: 12 W (48 Ω); - curentul maxim de iesire per canal: 500 mA; - tensiune de iesire: 24 Vc.c.; - protectie la suprasarcina si scurtcircuit; - tensiune de alimentare: 24 Vc.c. (19,2÷30 Vc.c.); - consum de curent: max. 45 mA; - consum de putere: max. 0,34 W; - LED-uri semnalizare stare iesiri. Modul cu 4 intrari analogice in curent (0/4 ÷ 20 mA): - timp de conversie analogic/digital: max. 6,5 μs; - rezolutie analogic/digital: 12 bit; - consum curent: 55 mA; Panou operator: - diagonala: minim 17,8 cm/7“; - rezolutie: 800 x 480 pixeli (WVGA); - tehnologie touch: rezistiv; - iluminare fundal: LED; - MTBF: 20000 h; - numar culori: 262144 - procesor: 454 MHz; - sistem de operare: MS Windows® CE 6.0;	
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- tensiune de intrare: 85 ÷ 264 Vc.a. / 100 ÷ 350 Vc.a.; - consum curent: 1,8 A la 230 Vc.a. / 1,8 A la 120 Vc.a.; - factor de putere: aprox. 0,5 - curent limita de pornire in sarcina/I2t: < 1,3 A2s; - timp tipic de raspuns: 150 ms (230 Vc.a.) / 200 ms (120 Vc.a.); - circuit de protectie: varistor integrat pentru protectia la regim tranzitoriu; - siguranta intrare: 6,3 A, integrate; - tensiune nominala de iesire: 24 Vc.c.; - curent nominal de iesire: 5 A (-25 ÷ 55°C); - curent maxim de iesire: 6 A; - scadere curent de iesire cu temperatura: 2,5%/K pentru 55 ÷ 70 °C; - eficienta: > 88 % (230 Vc.a., alimentare din retea); > 86 % (120 Vc.a., alimentare din retea); > 86 % (alimentare din baterie); - component alternativ in curentul de iesire: < 10 mVPP; - conectare in paralel: da, 2 dispozitive; - baterii externe acceptate: 1,3 Ah / 3,4 Ah / 7,2 Ah / 12 Ah; - caracteristica de incarcare: curba caracteristica I/U; - curent de incarcare: 0,2 A ÷ 1,5 A (implicit 1,0 A); - compensarea temperaturii: 0 ÷ 200 mV/K (implicit 42 mV/K); - interval verificare baterie: 4 h ÷ 200 h (implicit 12 h); - montaj: sina DIN; - MTBF (IEC 61709, SN 29500): > 596000 h (40 °C); - compatibilitate electromagnetica: in conformitate cu directive EMC 2004/108/EC; - emisie zgomot: EN 55011 (EN 55022); - directiva joasa tensiune: 2006/95/EC; - clasa de protectie: I; - grad de protectie: IP20; - temperatura ambientala operare: -25 ÷ +70 °C; - umiditate permisa operare: 95 % (la 20 °C, fara condens). Contor de energie - temperatura ambientala operare: -10 ÷ +55 °C; - umiditate permisa operare: 80 % (pina la 31 °C); - grad de protectie: IP52 (fata), IP30 (spate); - afisaj: LCD, iluminat; - tensiune de alimentare: 110 ÷ 400 Vc.a. ± 10 %; - putere nominala consumata: 5 VA; - putere maxima consumata cu toate modulele de extensie: 10 VA; - conformitate: CE;	- memorie RAM: 128 MB SDRAM; - interfata: 1 x Ethernet (10/100 Mbps, RJ45), 2 x RS-232/422/485, 1 x USB tip A, 1 x USB tip B, 1 x SD; - tensiune de alimentare: 24 Vc.c. ±15%; - curent consumat: 0,4 A; - grad de protectie: IP 66 (fata), IP 20 (spate); - temperatura ambientala operare/depozitare-transport: 0 ÷ 50 °C / -20 ÷ +85 °C; - umiditate permisa operare/transport-depozitare: 10 ÷ 95 %. Sursa cu UPS integrat: - tensiune de intrare: 85 ÷ 264 Vc.a. / 100 ÷ 350 Vc.a.; - consum curent: 1,8 A la 230 Vc.a. / 1,8 A la 120 Vc.a.; - factor de putere: aprox. 0,5 - curent limita de pornire in sarcina/I2t: < 1,3 A2s; - timp tipic de raspuns: 150 ms (230 Vc.a.) / 200 ms (120 Vc.a.); - circuit de protectie: varistor integrat pentru protectia la regim tranzitoriu; - siguranta intrare: 6,3 A, integrate; - tensiune nominala de iesire: 24 Vc.c.; - curent nominal de iesire: 5 A (-25 ÷ 55°C); - curent maxim de iesire: 6 A; - scadere curent de iesire cu temperatura: 2,5%/K pentru 55 ÷ 70 °C; - eficienta: > 88 % (230 Vc.a., alimentare din retea); > 86 % (120 Vc.a., alimentare din retea); > 86 % (alimentare din baterie); - component alternativ in curentul de iesire: < 10 mVPP; - conectare in paralel: da, 2 dispozitive; - baterii externe acceptate: 1,3 Ah / 3,4 Ah / 7,2 Ah / 12 Ah; - caracteristica de incarcare: curba caracteristica I/U; - curent de incarcare: 0,2 A ÷ 1,5 A (implicit 1,0 A); - compensarea temperaturii: 0 ÷ 200 mV/K (implicit 42 mV/K); - interval verificare baterie: 4 h ÷ 200 h (implicit 12 h); - montaj: sina DIN; - MTBF (IEC 61709, SN 29500): > 596000 h (40 °C); - compatibilitate electromagnetica: in conformitate cu directive EMC 2004/108/EC; - emisie zgomot: EN 55011 (EN 55022); - directiva joasa tensiune: 2006/95/EC; - clasa de protectie: I; - grad de protectie: IP20;	
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	- principiul de masurare: valoare R.M.S; - armonici: pina la armonica 51; - precizie: 0,2%; - domeniul de masura: 50 ÷ 500 Vc.a. (faza/faza), 28 ÷ 289 Vc.a. (faza/neutru); - frecventa: 50 ÷ 60 Hz; - masurarea se realizeaza cu transformatoare externe; - energie activa (IEC 62053-22): clasa 0,5 S; - putere reactiva (IEC 62053-23): clasa 2; - modul de comunicatie: RS 485. Comunicare cu dispeceratul SCADA Tabloul electric si de automatizare va prelua datele din statia de clorinare si va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA „APA CANAL” LEOVA. Date transmise in dispeceratul SCADA vor fi, fara a se limita la aceasta lista, urmatoarele: - starea de functionare a analizorului de clor si a sistemului de dozare; - parametrii electrici ai statiei de dezinfectie a apei cu hipoclorit de sodiu; - debitul instantaneu si totalizatorul de pe linia de dezinfectie a apei cu hipoclorit de sodiu; - prezenta tensiunii de alimentare; - starea comunicatiei GPRS; - regim statie de dezinfectie a apei cu hipoclorit de sodiu; - cantitate de clor/puls programata; - concentratie de clor programata; - alarma nivel scazut hipoclorit in rezervor; - alarma sisteme de dezinfectie a apei cu hipoclorit de sodiu; - volum de clor dozat; - numar de porniri ale pompei dozatoare de clor; - orele de functionare ale pompei dozatoare de clor; - temperatura apei.	- temperatura ambientala operare: -25 ÷ +70 °C; - umiditate permisa operare: 95 % (la 20 °C, fara condens). Contor de energie - temperatura ambientala operare: -10 ÷ +55 °C; - umiditate permisa operare: 80 % (pina la 31 °C); - grad de protectie: IP52 (fata), IP30 (spate); - afisaj: LCD, iluminat; - tensiune de alimentare: 110 ÷ 400 Vc.a. ± 10 %; - putere nominala consumata: 5 VA; - putere maxima consumata cu toate modulele de extensie: 10 VA; - conformitate: CE; - principiul de masurare: valoare R.M.S; - armonici: pina la armonica 51; - precizie: 0,2%; - domeniul de masura: 50 ÷ 500 Vc.a. (faza/faza), 28 ÷ 289 Vc.a. (faza/neutru); - frecventa: 50 ÷ 60 Hz; - masurarea se realizeaza cu transformatoare externe; - energie activa (IEC 62053-22): clasa 0,5 S; - putere reactiva (IEC 62053-23): clasa 2; - modul de comunicatie: RS 485. Comunicare cu dispeceratul SCADA Tabloul electric si de automatizare va prelua datele din statia de clorinare si va comunica prin GPRS (protocol Modbus TCP) cu dispeceratul SCADA de la SA „APA CANAL” LEOVA. Date transmise in dispeceratul SCADA vor fi, fara a se limita la aceasta lista, urmatoarele: - starea de functionare a analizorului de clor si a sistemului de dozare; - parametrii electrici ai statiei de dezinfectie a apei cu hipoclorit de sodiu; - debitul instantaneu si totalizatorul de pe linia de dezinfectie a apei cu hipoclorit de sodiu; - prezenta tensiunii de alimentare; - starea comunicatiei GPRS; - regim statie de dezinfectie a apei cu hipoclorit de sodiu; - cantitate de clor/puls programata; - concentratie de clor programata; - alarma nivel scazut hipoclorit in rezervor; - alarma sisteme de dezinfectie a apei cu hipoclorit de sodiu; - volum de clor dozat; - numar de porniri ale pompei dozatoare de clor;	
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		- orele de functionare ale pompei dozatoare de clor; - temperatura apei.	
2	Specificatii de performanta si conditii privind siguranta in exploatare. - Respectarea conditiilor de temperatura: -20 - + 60grade C; - Amplasare: retea distributie apa potabila; - Lichid de lucru: apa potabila; Montarea se va face conform instructiunilor de montare date de producator.	Specificatii de performanta si conditii privind siguranta in exploatare. - Temperatura: -20 - + 60grade C; - Amplasare: retea distributie apa potabila; - Lichid de lucru: apa potabila; Montarea se va face conform instructiunilor de montare date de producator.	
3	Conditii de garantie si postgarantie Min 24 luni garantie de la punerea in functiune. Se vor asigura piese de schimb si service specializat in garantie si post garantie. Piese de schimb in post garantie pe o perioada de 10 ani.	Conditii de garantie si postgarantie - 24 luni garantie de la punerea in functiune. Se vor asigura piese de schimb si service specializat in garantie si post garantie. Piese de schimb in post garantie pe o perioada de 10 ani.	
4	Alte conditii tehnice: Statia de dezinfectie a apei cu hipoclorit de sodiu va fi insotita de manual de exploatare, fise tehnice ale echipamentelor montate in proces si scheme electrice ale tabloului de automatizare.	Alte conditii tehnice: Statia de dezinfectie a apei cu hipoclorit de sodiu va fi insotita de manual de exploatare, fise tehnice ale echipamentelor montate in proces si scheme electrice ale tabloului de automatizare.	

Data completarii: 12.12.2022

Semnat: _____

Nume: Comanac Ion

Functia in cadrul firmei: Director

Denumirea ofertant : Laiola SRL

Date tehnice

Modul cu mai multe pompe

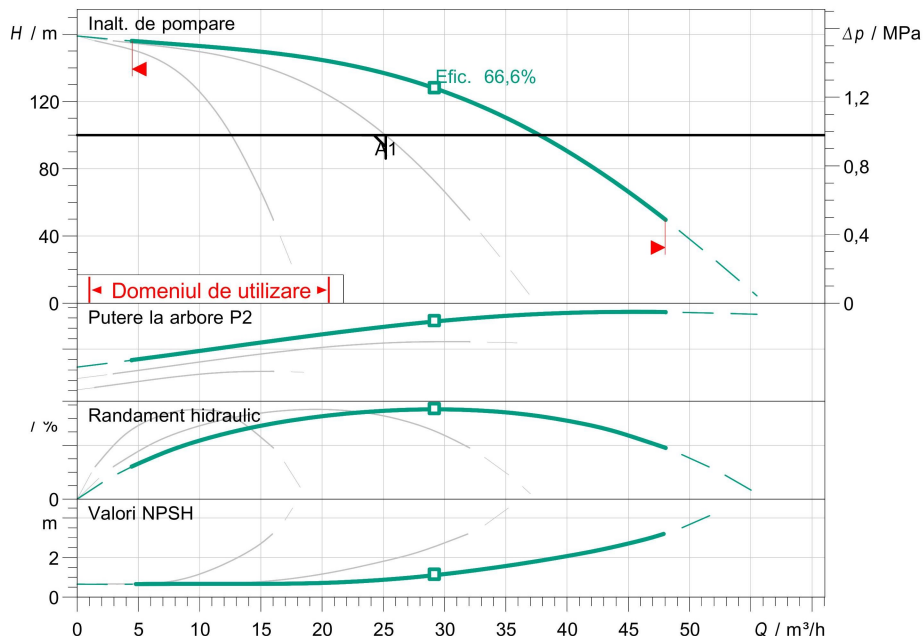
COR-3 Helix V 1015 MIDA Modbus 5,5 kW

Denumirea proiectului Untitled project 2022-12-12 09:49:48.441

Nr. proiect
Loc de montaj
Nr. pozitie client

Data 12.12.2022

Caracteristici



Datele cerute

Debit 25,20 m³/h
Inaltime de pompare 100,00 m
Fluidul vehiculat Apa 100 %
Temperatura fluidului pompat 20,00 °C
Densitate 998,30 kg/m³
Viscozitate cinematica 1,00 mm²/s

Date hidraulice (punct de lucru)

Debit 28,64 m³/h
Inaltime de pompare 129,12 m
Putere la arbore P2 15,14 kW

Date produs

Modul cu mai multe pompe
COR-3 Helix V 1015/K/CC-01
Comanda Cu convertizor de frecvență
Numarul de pompe 3
Presiunea max. de lucru 1,6 MPa
Presiune de alimentare max. 1 MPa
Temperatura fluidului pompat 3 °C ... + 50 °C
Max. temperatura ambienta 40 °C
Grad de protecție motor IP55
Grad de protecție panou de alarmare IP54
Vas sub presiune cu membrană yes
Senzor de oprire la lipsa apei no

Date motor

Motor nivel de eficiență IE3
Alimentare electrică 3~ 400 V / 50 Hz
Toleranță admisibilă tensiune +-10 %
Turație nominală 2900 1/min
Puterea nominala P2 5,50 kW
Intensitate nominală 10,50 A
Factor de putere 0,86
Randament 50%/ 75% / 100%
Clasă de izolație F
Protecția motorului yes

Cote racord

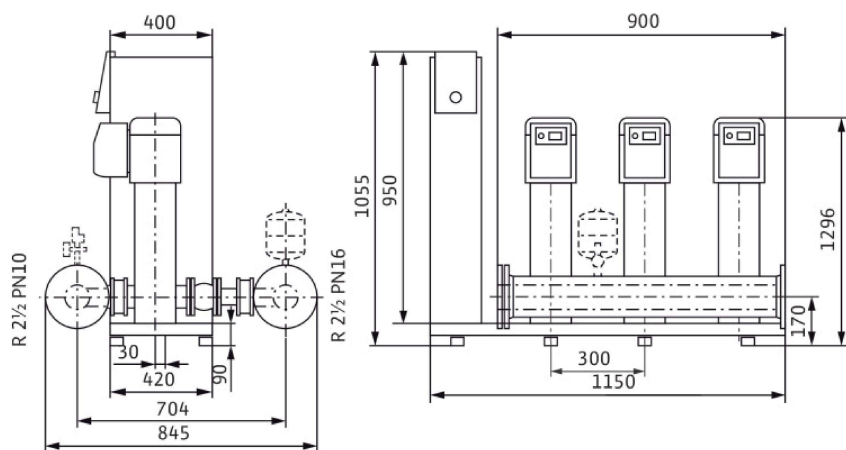
Racord conductă la aspirație R 2½, PN 10
Racord conductă pe refulare R 2½, PN 16

Materiale

Carcasă pompă 1.4301
Rotor hidraulic 1.4307
Arbore 1.4301
Garnitură arbore Q1BE3GG
Material etanșare EPDM
Material conducte 1.4404

Informații privind comanda

Greutate aprox. 475 kg
Nr. articol 2534187



Dimensiuni

	mm				
H	1900	L	900	P3	450
H1	185	L1	300	P4	25
HP	1395	LS	800	X	900
H3	105	P	895	DNs	R 2½, PN 10
HS	1900	P1	754	DNd	R 2½, PN 16

Safe, precise and cost-effective metering

Low-pressure metering pumps up to over 1,000 l/h



Contents



Low-pressure metering pumps up to over 1,000 l/h

Thanks to the huge diversity of its product range (dosing head, size, capacity, set up and control options), ProMinent® low-pressure metering pumps are capable of performing virtually all metering tasks sustainably and environmentally-friendly, at the same time saving energy.

Get in touch with us and discover the various opportunities provided by ProMinent® low-pressure pumps.

■ Contents	2
■ ProMinent	3
■ Technology at a glance	4
■ Products at a glance	6
■ Motor-driven metering pumps	
Sigma/1 basic type	8
Sigma/2 basic type	8
Sigma/3 basic type	8
■ Sigma X family	
Sigma/1 control type	10
Sigma/2 control type	10
Sigma/3 control type	10
■ Solenoid metering pumps	
Beta® b	12
gamma/ X	13
gamma/ XL	14
■ Peristaltic pumps	
DULCO®flex DF2a	15
DULCO®flex DF4a	15
DULCO flex Control DFXa	16
DULCO flex Control DFYa	17

ProMinent



Our extensive **product range** – well-metered and unrestrictedly reliable

You undoubtedly know ProMinent as a manufacturer of solenoid metering pumps? In fact that is our origin and we are the global market leader in this product range. However, for the 55 years that we have been in existence, we have substantially extended our product range for our customers. Why? Because we know and understand that you, as our customers, do not simply want a product from us, rather a solution to your problem – and justifiably so.

Every industry "works" differently, that is to say has its own unique peculiarities. We have adapted to this.

Expertise alone is not enough. Our customers are essential for ProMinent's success story. Their trust and the close dialogue relating to their requirements and needs is what has made our success possible.

World market leadership brings obligations, such as the need for close dialogue with customers. This dialogue shows that the trend is moving towards

more energy-efficient and environmentally-friendly technologies. ProMinent is reacting to this with a wealth of innovative product developments. With energy-efficient products. This means that the future will bring many more innovations in the field of chemical metering and water treatment developed in Heidelberg. They all have only one goal: to exceed our customers' expectations as far as possible.

Solenoid-driven metering pumps

Low-wear pumps for low capacities

Mode of operation

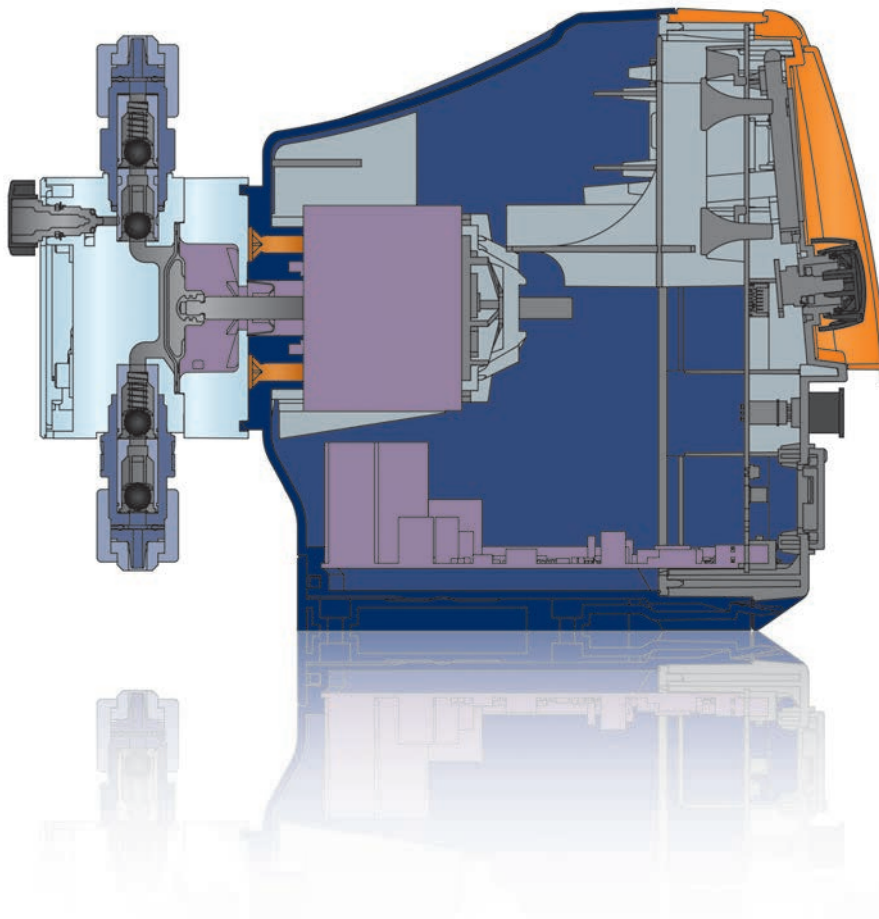
A magnet moves the solenoid shaft forwards and backwards by switching on and off. This stroke movement is transferred to the diaphragm in the dosing head. Two non-return valves prevent the feed chemical from flowing back during pumping. The stroke length and stroke rate can be adjusted to alter the capacity of a solenoid-driven metering pump.

Features

- Capacity range: 0.74 to 80 l/h at 25 to 2 bar back pressure
- Virtually wear-free power end/drive, as only one moving part is used – the pump has no lubricated bearing or shafts
- Outstanding long-term stability
- Cost-effective technical alternative in the lower capacity range
- Maximum protection from overloading
- Low energy consumption thanks to excellent efficiency
- IP 65 degree of protection due to fully sealed housing

Applications

- General: chemical metering in laboratories and in industry up to 80 l/h pumping capacity
- Potable water and swimming pool water treatment: metering of chemicals for disinfection and for pH correction
- General water treatment, process water, industrial water, and conditioners
- Cooling water circuits: metering disinfectants
- Mini-plant technology
- Paper industry, de-foamers
- Electroplating and surface treatment, pool additives, slide grinding systems



Motor-driven metering pumps

High level of dosing precision and robust technology

Mode of operation

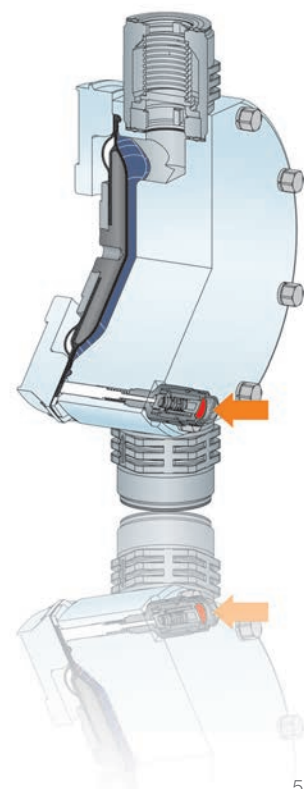
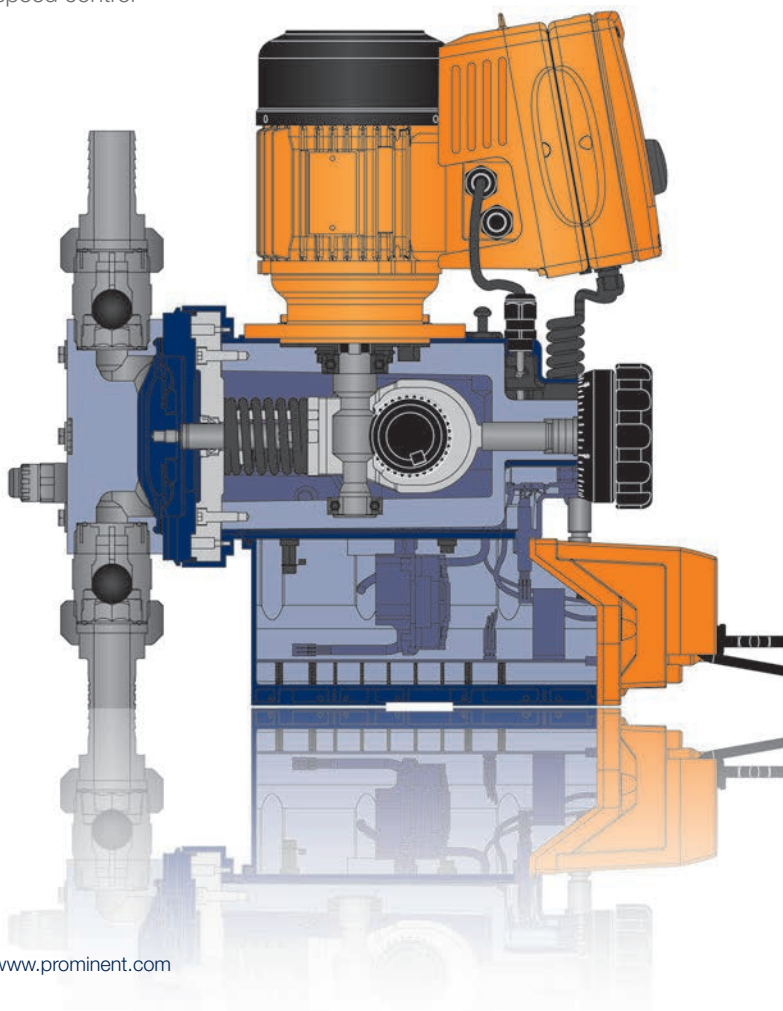
The stroke length and stroke rate – in this case the motor speed – can be adjusted to alter the capacity of this pump. The rotation of the electric motor is stepped down by a worm gear and converted into a linear stroke movement by a cam. The slide rod transfers this stroke movement to the diaphragm in the dosing head. Two non-return valves prevent the feed chemical from flowing back during pumping.

Features

- Extremely broad capacity range
- High dosing precision even under varying pressure conditions (rigid characteristic curve) enables chemical use to be reduced and ensures exact process control
- Robust and cost-effective drive in higher capacity classes
- Simple integration and retrofitting into automated processes by flexible control via stroke length and motor speed control
- Maximum safety thanks to multi-layer safety diaphragm with rupture warning system
- Sigma basic: robust pump for safe and reliable use
- Sigma X control type: reliable, smart and network-friendly

Applications

- General: chemical metering up to over 1,000 l/h
- Potable water treatment: metering disinfectants
- Cooling circuits: metering disinfectants
- Waste water treatment: metering flocculants
- Paper industry: metering additives
- Plastics production: metering additives



The broad-based range for reliability and precision

Motor-driven metering pumps

Sigma basic type

The robust pump for safe and reliable use

Sigma/ 1

Capacity range
17 – 120 l/h
12 – 4 bar

Sigma/ 2

Capacity range
50 – 350 l/h
16 – 4 bar

Sigma/ 3

Capacity range
146 – 1,030 l/h
12 – 4 bar



Sigma basic type

Sigma X family

Reliable, smart and network-friendly

Sigma/ 1

Capacity range
17 – 144 l/h
12 – 4 bar

Sigma/ 2

Capacity range
50 – 420 l/h
16 – 4 bar

Sigma/ 3

Capacity range
146 – 1,040 l/h
12 – 4 bar



Sigma control type

Sigma

For particular requirements

- MET, EAC certification
- Hygienic design
- Physiological safety with regard to the material
- EN10204 test certificates
- Special materials in the case of PVDF and >600l/h
- Project-specific solutions

Get in touch with us



Solenoid metering pumps

Beta® b

The all-rounder

Capacity range
0.74 – 32 l/h
25 – 2 bar



gamma/ X

For versatile
uses

Capacity range
2.3 – 45 l/h
25 – 2 bar



gamma/ XL

Capacity
perfected

Capacity range
8 – 80 l/h
25 – 2 bar



Peristaltic pumps

DULCO®flex

Precise and reproducible

DF2a

Capacity range 0.4/0.8/1.6/2.4 l/h
up to 1.5 bar

DF4a

Capacity range 1.5/6.0/12.0 l/h
up to 4 bar



DULCO flex Control

Combines top products

DFXa

Capacity range 0.01 – 30 l/h
up to 7 bar

DFYa

Capacity range 5.5 – 410 l/h
up to 8 bar



Sigma basic type

Motor-driven metering pump

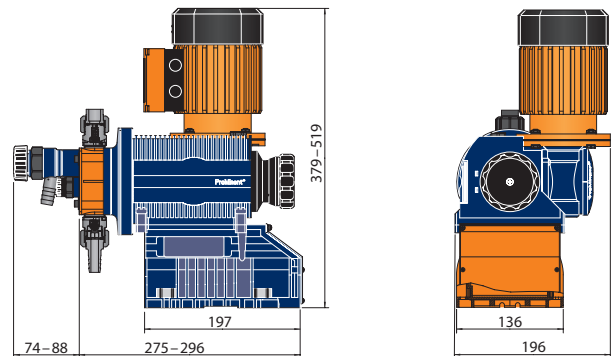
The right capacity for every application. There are two different versions of the Sigma product range available (the basic type and the control type).

The three versions differ in terms of their capacities:

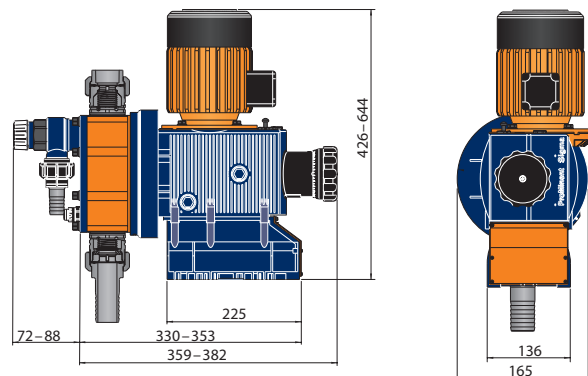
- Sigma/ 1** 17–120 l/h, 12–4 bar
- Sigma/ 2** 50–350 l/h, 16–4 bar
- Sigma/ 3** 146–1,030 l/h, 12–4 bar

- Process reliability thanks to multi-layer diaphragm with diaphragm rupture warning system
- Reliable operation due to bleeding option
- Integrated relief valve protects against overloading
- Simplified management of spare parts when using the Sigma product range
- Wide choice of drive variants, also for use in Exe and Exde areas and different flange designs for the use of customised motors.
- Servomotors or stroke control motors for adjusting the stroke length
- 2 standard materials PVDF/PTFE, stainless steel/PTFE

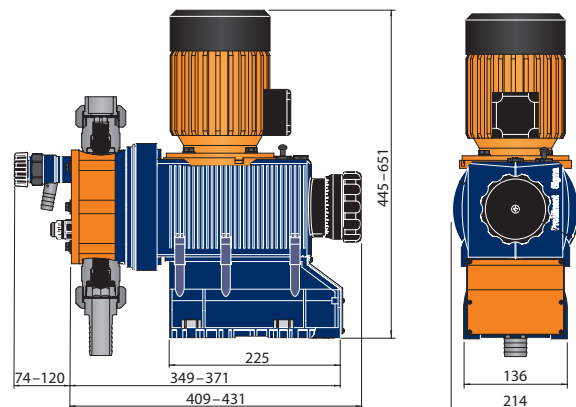
Sigma/ 1



Sigma/ 2



Sigma/ 3





Pump type	Pump capacity at max. back pressure							Suction lift mWS	Reliable pre-pressure on suction side bar	Connector Suction/ discharge side G-DN
	with motor operating at 1,500 rpm at 50 Hz operation			Stroke rate Strokes/ min	with motor operating at 1,800 rpm at 60 Hz operation		Stroke rate Strokes/ min			
	bar	l/h	ml/stroke		psi	l/h				
Sigma/ 1 basic type (S1Ba)										
12017	12	17	3.8	73	174	20	88	7	1	¾–10
12035	12	35	4.0	143	174	42	172	7	1	¾–10
10050	10	50	4.0	205	145	60	246	7	1	¾–10
10022	10	22	5.0	73	145	26	88	6	1	¾–10
10044	10	44	5.1	143	145	53	172	6	1	¾–10
07065	7	65	5.2	205	102	78	246	6	1	¾–10
07042	7	42	9.5	73	102	50	88	3	1	1–15
04084	4	84	9.7	143	58	101	172	3	1	1–15
04120	4	120	9.7	205	58	144	246	3	1	1–15
Sigma/ 2 basic type (S2Ba)										
16050	16	47	11.4	73	232	57	87	7	3	1–15
16090	16	88	11.4	132	232	98	158	7	3	1–15
16130	16	124	10.9	198	232	148	238	7	3	1–15
07120	7	126	27.4	73	102	150	87	5	1	1½–25
07220	7	220	27.7	132	102	264	158	5	1	1½–25
04350	4	350	29.4	198	58	420	238	5	1	1½–25
Sigma/ 3 basic type (S3Ba)										
120145	12	146	33.7	72	174	174	86	5	2	1½–25
120190	12	208	33.7	103	174	251	124	5	2	1½–25
120270	12	292	33.8	144	174	351	173	5	2	1½–25
120330	12	365	33.8	180	174	–	–	5	2	1½–25
070410	7	410	95.1	72	102	492	86	4	1	2–32
070580	7	580	95.1	103	102	696	124	4	1	2–32
040830	4	830	95.1	144	58	1,000	173	3	1	2–32
041030	4	1,030	95.1	180	58	–	–	3	1	2–32

Dosing head, PVDF design, max. 10 bar. ** DN32 plate valves with valve spring

Wetted materials					Integral relief valve
Material	Dosing head	Suction/pressure connector	Seals/ball seat	Valve balls	
Sigma/ 1 + Sigma/ 2					
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic	PVDF/FPM or EPDM
SST	Stainless steel material no. 1.4404	Stainless steel material no. 1.4581	PTFE/PTFE	Stainless steel material no. 1.4404	Stainless steel/FPM or EPDM

ATEX design: TTT wetted materials, PTFE+25% carbon, PTFE+25% carbon, PTFE/PTFE, ceramic

Material	Suction/pressure connection of dosing head	DN 25 ball valves			DN 32 plate valves			Integral relief valve
		Seals	Valve balls	Valve seats	Seals	Valve plates/ valve springs	Valve seats	
Sigma/ 3								
PVT	PVDF	PTFE	Glass	PTFE	PTFE	Ceramic/ Hast C. + CTFE	PTFE	PVDF/FPM or EPDM
SST	Stainless steel material no. 1.4404	PTFE	Stainless steel material no. 1.4404	PTFE	PTFE	Stainless steel 1.4404/Hast C.	PTFE	Stainless steel/FPM or EPDM

Multi-layer safety diaphragm with PTFE support in all designs. FPM: fluorine rubber

Alternative material versions available on request.

TTT, PTFE+25% carbon, PTFE, ceramic, PTFE, PVDF, ceramic/Hast C. + CTFE, for ATEX design

Sigma X control type

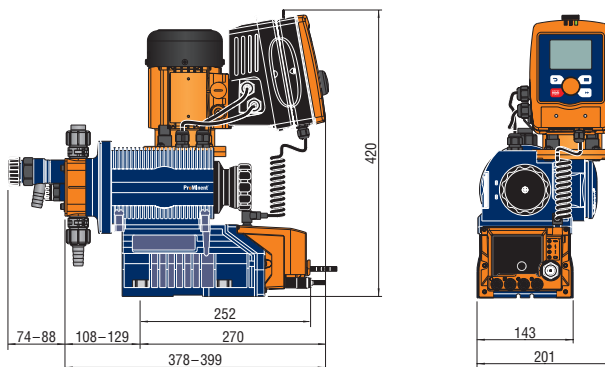
Motor-driven metering pump

The Sigma X type is a smart, flexible motor-driven metering pump that is setting new standards in terms of operating convenience, reliability and safety.

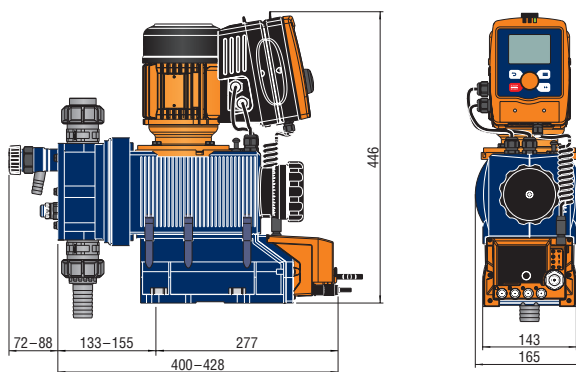
The Sigma X diaphragm metering pump covers a capacity range of 21 to 1,040 l/h in the S1Cb, S2Cb and S3Cb variants. Efficient protection of the power end from overloading by means of an integral frequency converter with microprocessor controller. One highlight is the standardised operating concept with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience. The Sigma, like all smart ProMinent metering pumps, can be flexibly connected to various bus systems. It has a large adjustment range thanks to a combination of frequency and stroke length adjustment. The pump works with high precision across the entire frequency range. Accurate and complication-free metering of viscous and gaseous media by adjustment of the movement profile. Operating statuses are transferred remotely via additional relay modules. Relevant spare parts can be shown in the display.

- External control is scalable via potential-free contacts with pulse step-up and step-down, batch mode or via a 0/4-20 mA standard signal
- Can be flexibly networked: connection to process management systems via integrated PROFIBUS®, CANopen interface (optional)
- Bluetooth and Wi-Fi connection for the simple configuration of parameters and call-up of process data (optional)

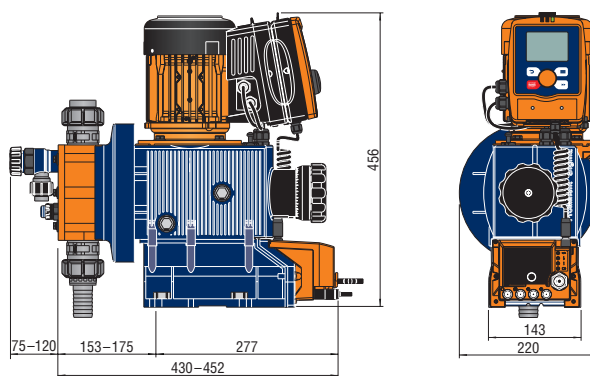
Sigma/ 1



Sigma/ 2



Sigma/ 3



Capacity ranges:

Sigma/ 1 17–117 l/h, 12–4 bar

Sigma/ 2 61–353 l/h, 16–4 bar

Sigma/ 3 182–1,040 l/h, 12–4 bar



Sigma X family

Pump type	Pump capacity at max. back pressure		Stroke rate	Suction lift	Reliable pre-pressure on suction side	Connector Suction/ discharge side
	bar	l/h	ml/stroke	Strokes/min	bar	G-DN
Sigma/ 1 control type (S1Cb)						
12017	12	21	3.9	90	7	1
12035	12	42	4.0	170	7	1
10050	10	49	4.0	200	7	1
10022	10	27	5.1	90	6	1
10044	10	53	5.1	170	6	1
07065	7	63	5.1	200	6	1
07042	7	52	9.5	90	3	1
07084	4	101	9.7	170	3	1
04120	4	117	9.7	200	3	1
Sigma/ 2 control type (S2Cb)						
16050	16	56	10.4	90	7	2
16090	16	99	10.3	160	7	2
16130	16	129	10.9	200	7	2
07120	7	150	27.4	90	5	1
07220	7	271	27.7	160	5	1
04350	4	353	29.4	200	5	1
Sigma/ 3 control type (S3Cb)						
120145	12	182	33.7	90	5	2
120190	12	243	33.7	120	5	2
120270	12	365	33.8	180	5	2
070410	7	500	95.1	90	4	1
070580	7	670	95.1	120	4	1
040830	4	1,040	95.1	180	3	1

Dosing head, PVDF design, max. 10 bar. **DN32 plate valves

Wetted materials					Integral relief valve
Material	Dosing head	Suction/pressure connector	Seals/ball seat	Valve balls	
Sigma/ 1 + Sigma/ 2					
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic	PVDF/FPM or EPDM
SST	Stainless steel material no. 1.4404	Stainless steel material no. 1.4581	PTFE/PTFE	Stainless steel material no. 1.4404	Stainless steel/FPM or EPDM

DN 25 ball valves				DN 32 plate valves				Integral relief valve
Material	Suction/pressure connection of dosing head	Seals	Valve balls	Valve seats	Seals	Valve plates/ valve springs	Valve seats	
Sigma/ 3								
PVT	PVDF	PTFE	Glass	PTFE	PTFE	Ceramic/ Hast C. + CTFE	PTFE	PVDF/FPM or EPDM
SST	Stainless steel material no. 1.4404	PTFE	Stainless steel material no. 1.4404	PTFE	PTFE	Stainless steel 1.4404/Hast C.	PTFE	Stainless steel/FPM or EPDM

Multi-layer safety diaphragm with PTFE support in all designs. FPM: fluorine rubber

Alternative material versions available on request.

MET, EAC design (optional).

Beta[®] b

Solenoid-driven metering pump

The first choice for modern water treatment and chemical metering.

- Capacity range
0.74–32 l/h, 25–2 bar
- Up to 50 % energy-savings through improved efficiency
- Adjustable, integrated pulse step-up and step-down for optimum adaptation to external signal generators
- Dosing heads to suit all chemicals ensure all-purpose use
- Virtually wear-free power end/drive
- Outstanding long-term stability
- Optional: relay module can be quickly and simply retrofitted
- Input for level switch



Pump type	Pump capacity at max. back pressure			Stroke rate Strokes/min	Suction lift mWs	Connector size a Ø x i Ø mm	Average power consumption W
	bar	l/h	ml/stroke				
BT4b 1000	10	0.74	0.07	180	6.0	6 x 4	7.2
BT4b 1601	16	1.10	0.10	180	6.0	6 x 4	9.6
BT4b 1602	16	2.20	0.20	180	6.0	6 x 4	11.2
BT4b 1604	16	3.60	0.33	180	6.0	6 x 4	15.2
BT4b 0708	7	7.10	0.66	180	6.0	8 x 5	15.2
BT4b 0413	4	12.30	1.14	180	3.0	8 x 5	15.2
BT4b 0220	2	19.00	1.76	180	2.0	12 x 9	15.2
BT5b 2504	25	2.90	0.27	180	6.0	8x4 ¹⁾	19.2
BT5b 1008	10	6.80	0.63	180	6.0	8 x 5	19.2
BT5b 0713	7	11.00	1.02	180	4.0	8 x 5	19.2
BT5b 0420	4	17.10	1.58	180	3.0	12 x 9	19.2
BT5b 0232	2	32.00	2.96	180	2.0	12 x 9	19.2

Beta[®] b metering pumps are also available with a self-bleeding dosing head and for higher-viscosity media.

Pressure-reduced pump types are available in the pressure stages 4, 7 and 10 bar for special applications, for example in the swimming pool sector.

Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line.

1) 6 mm connector width for stainless steel design.

Wetted materials					
Design	Dosing head	Suction/pressure connector	Seals	Valve balls	Ball seat
PPT	Polypropylene	PVDF	PTFE	Ceramic	PVDF
NPT	Clear acrylic	PVDF	PTFE	Ceramic	PVDF
PVT	PVDF	PVDF	PTFE	Ceramic	PVDF
TTT	PTFE + carbon	PTFE + carbon	PTFE	Ceramic	Ceramic
SST	Stainless steel material no. 1.4404	Stainless steel material no. 1.4404	PTFE	Ceramic	Ceramic

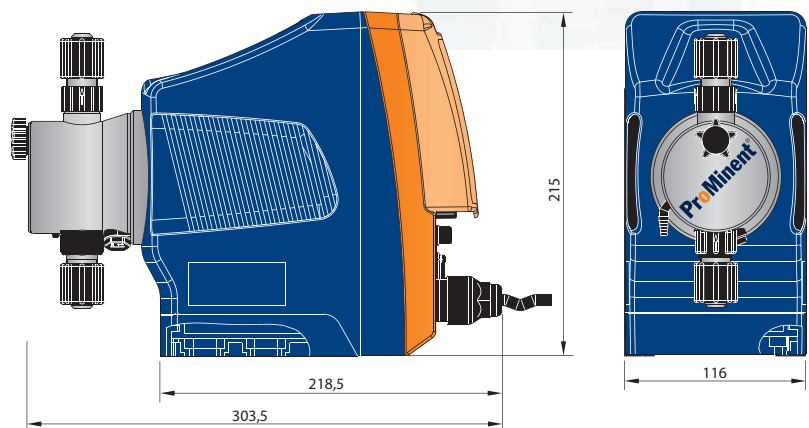
DEVELOPAN[®] diaphragms with PTFE support in all designs.

gamma/ X

Solenoid-driven metering pump

The gamma/ X is ideal for all metering work involving liquid media.

- Capacity range
2.3–45 l/h, 25–2 bar
- Simple adjustment of the capacity directly in l/h
- Detection of hydraulic malfunctions or blocked discharge lines ensures smooth process
- Integrated pressure measurement and display for greater safety during commissioning and in the process
- Integrated 7-day timer for timed metering tasks
- Connection to CAN-Open, Profinet, Profibus or Modbus process control systems



Pump type	Pump capacity at max. back pressure			Stroke rate Strokes/min	Suction lift mWs	Connector size a Ø x i Ø mm
	bar	l/h	ml/stroke			
GMXa 1602	16	2.3	0.19	200	6.0	6 x 4
GMXa 1604	16	3.6	0.30	200	5.0	6 x 4
GMXa 0708	7	7.6	0.63	200	4.0	8 x 5
GMXa 0414	4	13.5	1.13	200	3.0	8 x 5
GMXa 0220	2	19.7	1.64	200	2.0	12 x 9
GMXa 2504	25	3.8	0.32	200	4.0	8 x 4 ¹⁾
GMXa 1009	10	9.0	0.75	200	3.0	8 x 5
GMXa 0715	7	14.5	1.21	200	3.0	8 x 5
GMXa 0424	4	24.0	2.00	200	3.0	12 x 9
GMXa 0245	2	45.0	3.70	200	2.0	12 x 9

gamma/ X metering pumps are also available with self-bleeding dosing head and for higher-viscosity media.

Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line.

1) 6 mm connector width for stainless steel design.

Wetted materials					
Design	Dosing head	Suction/pressure connector	Seals	Valve balls	Ball seat
PPT	Polypropylene	PVDF	PTFE	Ceramic	PVDF
NPT	Clear acrylic	PVDF	PTFE	Ceramic	PVDF
PVT	PVDF	PVDF	PTFE	Ceramic	PVDF
TTT	PTFE with carbon	PTFE with carbon	PTFE	Ceramic	Ceramic
SST	Stainless steel material no. 1.4404	Stainless steel material no. 1.4404	PTFE	Ceramic	Ceramic

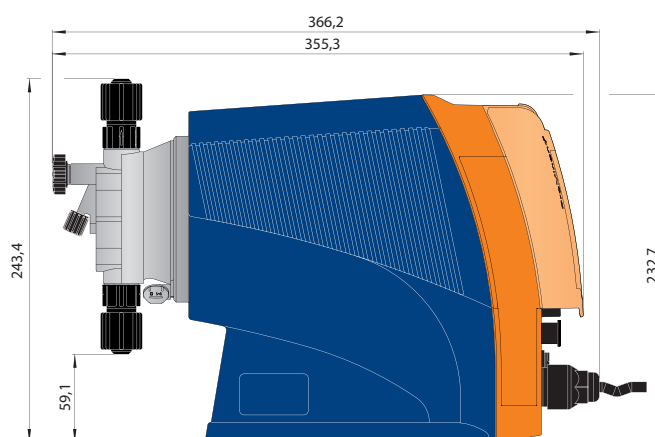
DEVELOPAN® diaphragms with PTFE support in all designs.

gamma/ XL

Solenoid-driven metering pump

The gamma/ XL is a smart, network-compatible solenoid-driven metering pump that is setting new standards in productivity, reliability and cost-effectiveness.

- Capacity range
8–80 l/h, 25–2 bar
- Simple adjustment of the metering rate directly in l/h or gph
- Integrated pressure measurement and display for greater safety during commissioning and in the process
- Bluetooth and Wi-Fi connection for simple configuration and call-up of process data (optional)
- Capacity adjustment range
1:40,000
- Direct input of the required final concentration in concentration mode with volume-proportional metering tasks
- Virtually wear-free solenoid drive, overload-proof and economical



Pump type	Pump capacity			Stroke rate Strokes/min	Suction lift mWs	Connector size a Ø x i Ø mm
	bar	l/h	ml/stroke			
gamma/ XL						
GXL a 2508	25	8	0.67	200	5*	8x4 **
GXL a 1608	16	8	0.67	200	5*	8x5 **
GXL a 1612	16	12	1.0	200	6*	8 x 5
GXL a 1020	10	20	1.7	200	5*	12 x 9
GXL a 0730	7	30	2.5	200	5*	12 x 9
GXL a 0450	4	50	4.2	200	3*	G 3/4 - DN 10
GXL a 0280	2	80	6.7	200	2*	G 3/4 - DN 10
gamma/ XL metering pumps with self-bleeding dosing head without bypass*						
GXL a 1608	16	3.8	0.32	200	1.8	8 x 5
GXL a 1612	16	6.5	0.54	200	1.8	8 x 5
GXL a 1020	10	14	1.17	200	1.8	12 x 9
GXL a 0730	7	28	2.33	200	1.8	12 x 9

* Suction lift (mWS) = suction lift with a filled dosing head and filled suction line

** 6 mm connection width for stainless steel design

Wetted materials					
Design	Dosing head	Suction/pressure connector	Seals	Valve balls	Ball seat
NPT	Clear acrylic	PVDF	PTFE	Ceramic	PVDF
PVT	PVDF	PVDF	PTFE	Ceramic	PVDF
SST (8 - 12 mm)	Stainless steel material no. 1.4404	Stainless steel material no. 1.4404	PTFE	Ceramic	Ceramic
SST (DN 10)	Stainless steel material no. 1.4404	Stainless steel material no. 1.4404	PTFE	Ceramic	PTFE with carbon

DULCO®flex

Peristaltic pump

The best solutions are simple. The optimum range of pumps for typical use in swimming pools, hot tubs and spa and wellness facilities.

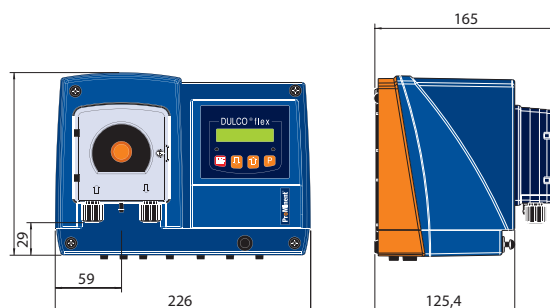
DF2a for private swimming pools

DF4a for private and public swimming pools, and for general chemical metering.

- Capacity range
0.4–12 l/h, 4–1.5 bar
- Virtually silent operation
- Simple and safe to operate
- Efficient operation through "eco mode" possible
- Service-friendly design
- Capacity adjustment range
1:40,000
- Spring-mounted rollers for uniform roller pressure and increased service life of the hose



DULCO®flex DF4a



Pump type	Pump capacity		Speed	Suction lift	Priming lift	Connector size
	bar	l/h	rpm	mWS	mWS	a Ø x i Ø mm
DULCO®flex DF2a						
0204	1.5	0.4	5	4	3	6x4/10x4
0208	1.5	0.8	10	4	3	6x4/10x4
0216	1.5	1.6	20	4	3	6x4/10x4
0224	1.5	2.4	30	4	3	6x4/10x4
DULCO®flex DF4a						
04004	4.0	0.4	0–85	4	3	6x4/10x4
04015	4.0	1.5	0–85	4	3	6x4/10x4
03060	2.5	6.0	0–85	4	3	6x4/10x4
02120	2.0	12.0	0–85	4	3	6x4/10x4

DULCO flex Control DFXa

Peristaltic pump

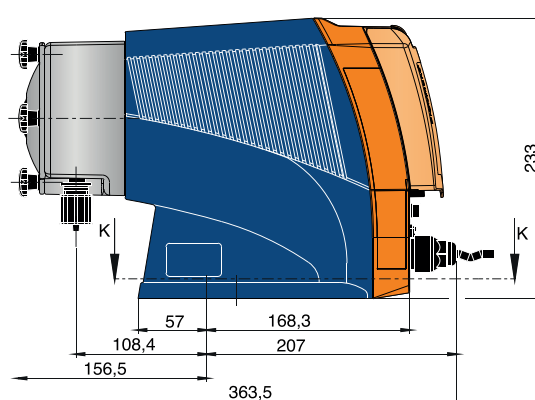
A peristaltic pump that brings together the best qualities of ProMinent metering pumps.

The DULCO flex Control - DFXa meters gaseous, viscous, abrasive or shear-sensitive media and is setting new standards in metering. Linear and reproducible metering is guaranteed with this peristaltic pump under all process conditions. Hose replacement is a very simple process.

- Capacity range
0.01 – 30 l/h, up to 7 bar
- Adjustment of the metering rate directly in l/h or gph
- Simple hose change
- No problems with very gaseous media or air locks
- Sole contact with media in the hose
- Many different control options, such as using an analogue 0/4-20 mA signal, contact controller, timer or via process control systems
- Suitable for viscosities of up to 200,000 mPas



DULCO flex Control DFXa



Pump type	Pump capacity bar	l/h	Speed rpm	Suction lift mWS	Priming lift mWS	Connector size a Ø x i Ø mm
DULCO®flex Control DFXa						
0730	7	0.01 - 30	100	9	9	12 x 9
0530	5	0.01 - 30	100	9	9	12 x 9

DULCO flex Control DFYa

Peristaltic pump

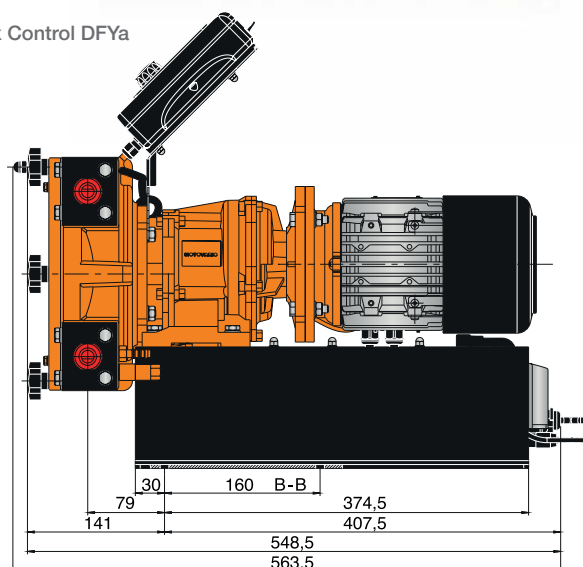
The peristaltic pump DULCO flex Control - DFYa combines the properties of top products from the ProMinent product range.

The valveless peristaltic pump DULCO flex Control - DFYa guarantees precise, linear and reproducible metering in all process conditions. It meters gaseous, viscous, shear-sensitive media, possibly containing particles, with ease – ProMinent is therefore setting new standards in metering with peristaltic pumps.

- Capacity range
5.5 – 410 l/h, up to 8 bar
- Operation by contact, batch, manual, analogue or BUS control
- Adjustment of the metering rate directly in l/h or gph
- Connection to process control systems via a BUS interface, such as PROFIBUS®, Profinet or CANopen
- No problems with very gaseous media or air locks
- Simple, menu-guided hose change
- Reversible direction of rotation
- Suitable for viscosities of up to 40,000 mPas



DULCO flex Control DFYa



Pump type	Pump capacity bar	l/h	Speed rpm	Suction lift mWS	Priming lift mWS
DULCO®flex Control DFYa					
08410	8	5.5 - 410 ± 10 %	80	8	8
04410	4	5.5 - 410 ± 10 %	80	8	8
02410	2	5.5 - 410 ± 10 %	80	8	8

Worldwide contacts



Ready for you. Any time, anywhere.

ProMinent is at home in more than 100 countries across the globe. This guarantees the worldwide availability of our products and comprehensive expertise on the ground with close proximity to the customer. We offer the same high quality standards for our solutions and services all over the world. And we work day in, day out to keep our promise: Ready for you. Any time, anywhere.

You can find the contact details of local branches and agencies at
www.prominent.com/en/locations

You can find the ProMinent app for iPad and iPhone
in the iTunes App Store or at
www.prominent.com/app



ProMinent Group

info@prominent.com
www.prominent.com

Reliable measuring and control

Precision by design



Precision in detail

Overall perfection – the optimum in control circuits



Working together for accurate results

The precise interplay between metering pumps, controllers and sensors is a guarantee for optimum metering.

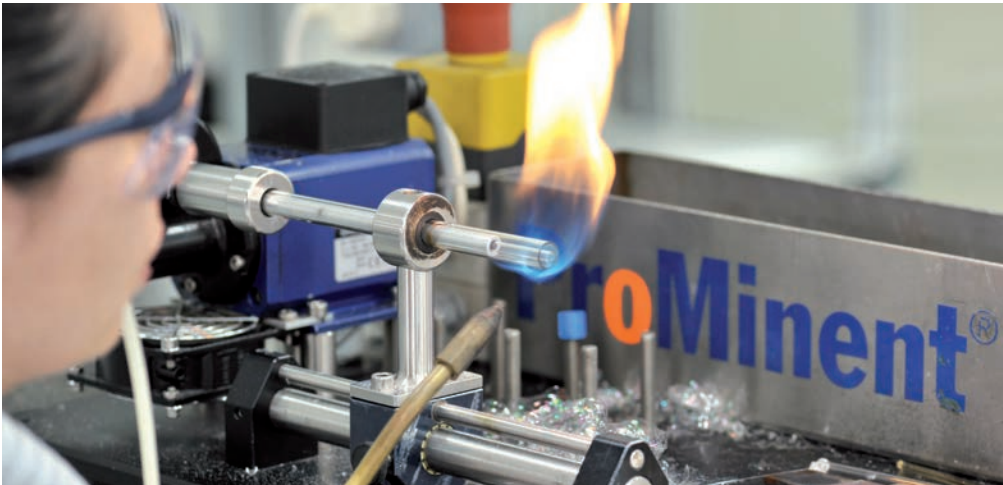
ProMinent provides you with the best possible safety through its use of perfectly coordinated components.

- Metering pumps that only meter the volume of chemicals needed at any time
- Sensors that deliver absolutely reliable and precise measured values in real time
- Controllers that match your customer-specific applications with technical precision

Choose your efficient complete solution from ProMinent for your specific metering task.



Comprehensive solutions for precise metering, measuring and controlling



Metering pumps

Chemical metering is the core task of any metering pump – and ProMinent offers metering pumps covering every performance class and design. The market leader in solenoid diaphragm pumps also offers an exceptional range of medium- and high-pressure pumps.

- Solenoid diaphragm pumps: up to 75 l/h
- Motor-driven diaphragm pumps: up to 1,000 l/h
- Hydraulic diaphragm pumps: up to 50,000 l/h
- Plunger pumps: up to 38,000 l/h
- Non-standard metering pumps

Sensor technology

The DULCOTEST® line of sensors offers the wide availability of online chemical measuring parameters that enable a limit value to be monitored or a closed control circuit to be constructed.

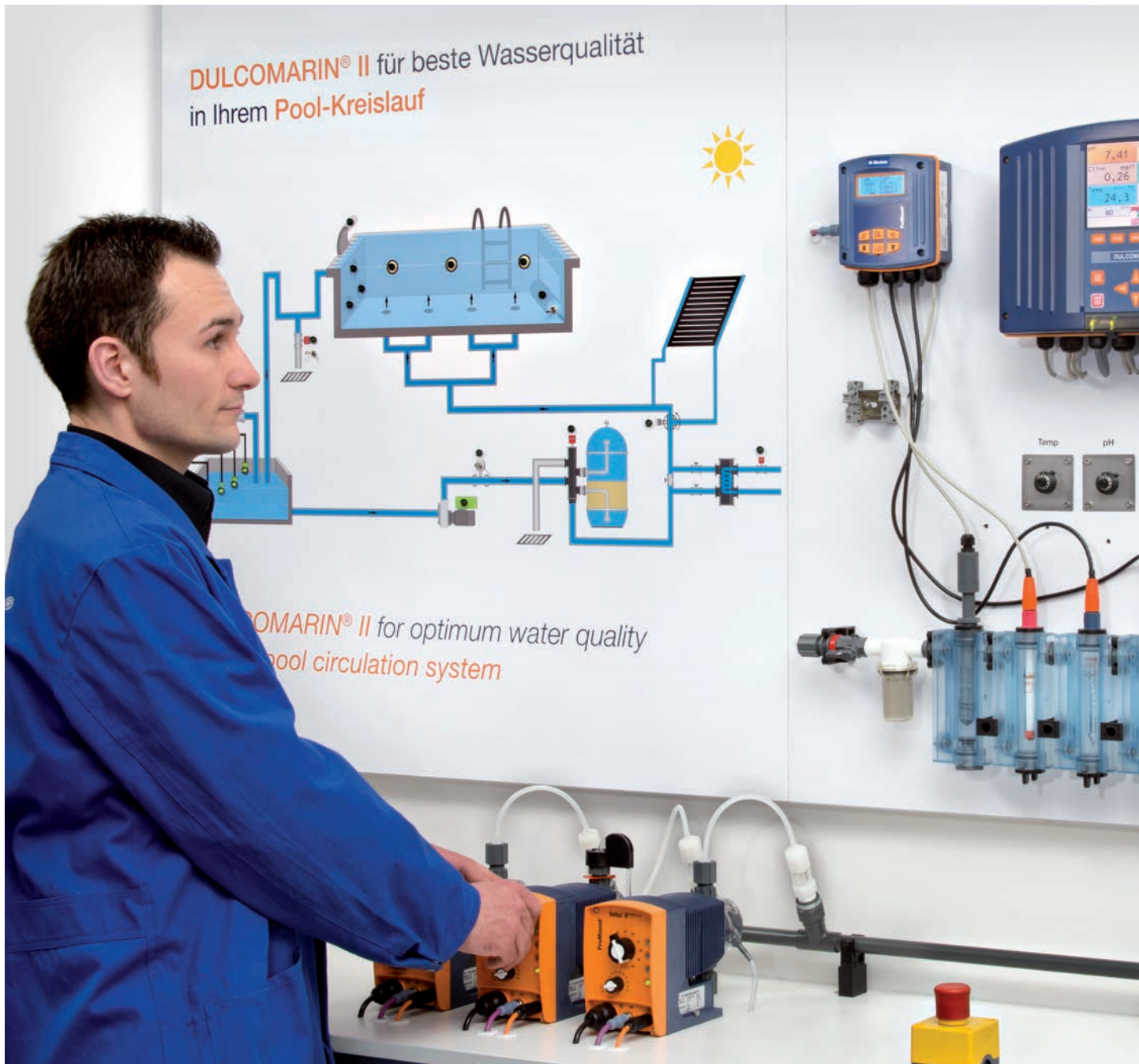
- pH value
- ORP
- Electrolytic conductivity
- Turbidity
- Free chlorine
- Total available chlorine
- Combined chlorine
- Total chlorine
- Chlorine dioxide
- Chlorite
- Bromine
- Ozone
- Dissolved oxygen
- Hydrogen peroxide
- Peracetic acid
- Fluoride
- Temperature

DULCOTEST® sensors deliver precise, reliable, application-specific measured values in real time. The sensors can be optimally integrated into the ProMinent control circuit along with controllers and metering pumps. Suitable bypass, installation and immersion fittings are also available for specific integration into the process.

Measuring and control technology

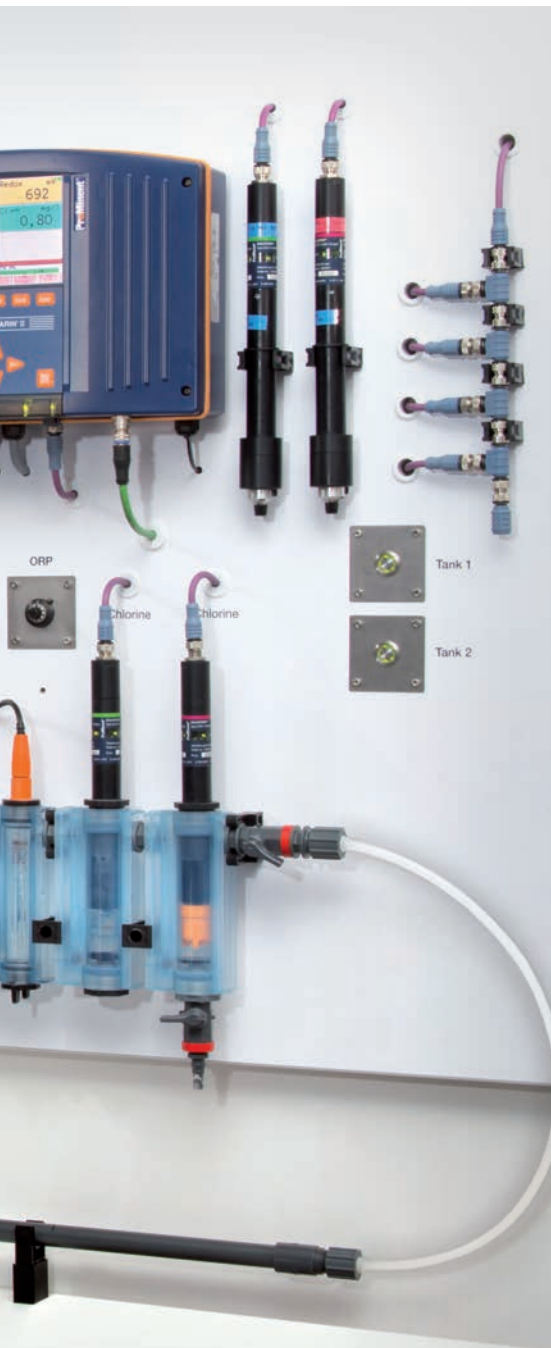
ProMinent's controllers can be easily adapted to your specific application. Closely graded performance classes and application-optimised functions provide the right solution for every measurement and control task. ProMinent offers complete product ranges covering everything from simple measurement signal conversion tasks, forwarding of data to central controllers and calibration of devices with measured value displays through to specialist controllers for complex, application-specific control tasks for various industrial sectors. PROFIBUS® DP, PROFINET and Modbus RTU components are available for integrating circuits into a higher-level control system.

- Compact controller
- 1-channel controller D1C
- 2- and 3-channel multi-parameter controller DACb
- Multi-channel controller DULCOMARIN®
- Various measuring transducers / transmitters
- Manual measuring instruments



Measuring and control technology made easy

Process measurement stations fully assembled and ready for operation



Online process measurement stations are fully assembled and quickly started up. They are central components of control circuits for metering chemicals. The measured values are available in real time around the clock: this applies equally to the efficient control of chemical parameters in process water and determining the quality of treated water.

ProMinent measuring and control stations are offered with DULCOTROL® and DULCODOS® Pool as complete online measuring and control units for potable water, food and beverage applications, waste water and swimming pools. Different designs are available to suit a range of applications. Individual configurations are also offered for customer-specific applications.

- Reliable and precise measurements
- Simple and flexible installation
- Economical thanks to minimal maintenance requirements
- Long operational lifetime thanks to high-grade materials and robust construction
- Precise handling

Users profit from extremely quick delivery times and straightforward commissioning thanks to plug & play technology. All of the components required for measurement, control and monitoring of the different types of water are coordinated with each other and mounted on a PE plate wired ready for connection.

Benefits

- All of the components are perfectly coordinated and wired ready for connection
- Configuration of 1-3 measuring points, depending on the measuring, control or monitoring task
- The application-specific ordering system enables straightforward, quick and correct configuration of your measuring and control station



Measuring and control technology

Perfection for every requirement



Maximum safety

DULCOTROL® potable water

Panel-mounted measuring and control stations for reliable treatment and monitoring of potable and similar water as well as for rinsing water and industrial/process water for use in the food and beverage industry:

- Disinfection
- CIP (Cleaning In Place)
- pH adjustment
- Monitoring

Water to be measured

- Potable water
- Process water, product water
- Rinsing water, industrial water

Available measured variables (one or a combination of 2 measured variables)

- Free chlorine
- Combined chlorine (chloramine)
- Total chlorine
- pH value
- ORP
- Chlorine dioxide
- Chlorite
- Hydrogen peroxide
- Peracetic acid
- Conductivity, temperature
- Ozone
- Fluoride
- Dissolved oxygen

Optimally purified

DULCOTROL® waste water

Panel-mounted measuring and control stations for waste water treatment:

- pH neutralisation and pH adjustment
- Disinfection of purified water
- Elimination of reducing agents and oxidants for the purpose of detoxification
- Desalination of process water
- Monitoring of rinsing water
- Control of dissolved oxygen at the biological clarifying stage

Water to be measured

- Clear waste water
- Waste water with viscous media (turbid)
- Waste water with fluoride and pH < 7

Available measured variables (up to 3 combinations)

- pH value
- ORP
- Total chlorine
- Conductivity
- Chlorine dioxide
- Ozone
- Hydrogen peroxide
- Fluoride
- Temperature

Metering, measuring and control systems

DULCODOS® POOL

DULCODOS® Pool, the right type for every requirement.

The metering systems DULCODOS® Pool ensure the best water quality. The

systems come in four different designs. It's easy to work out which type is best suited to your requirements.



DULCODOS® Pool Soft

DULCODOS® Pool Soft is especially suited to private pools used by a small number of people. It uses active oxygen compounds, which are less effective than chlorine. Water treatment with active oxygen is a good alternative for ecologically-minded pool owners or if users are allergic to chlorine. DULCODOS® Pool Soft uses no chlorine chemicals.

- For swimming pools with volumes of up to 100 m³



DULCODOS® Pool Basic

DULCODOS® Pool Basic regulates the pH and chlorine content via the ORP. This is the direct measurement of effective oxidation in the water and is therefore an indication of the disinfectant effect and concentration of the metered chlorine. The concentration of chlorine cannot be determined with accuracy with this process. ORP measurements allow a particular range of chlorine to be set. DULCODOS® Pool Basic is robust and requires little maintenance.

- For swimming pools with circulation capacity of up to 200 m³



DULCODOS® Pool Comfort

DULCODOS® Pool Comfort uses highly specific chlorine measuring cells to control the chlorine content. The concentration of chlorine in the water can be determined and set with accuracy. The effectiveness of the swimming pool filter is boosted by an integrated feeder assembly for flocculant – resulting in crystal-clear water! Numerous features to enhance operating convenience, such as measured values being mapped by a screen plotter or remote control from your PC, iPad or other tablet device using an integrated web server, make the metering system very popular with customers.

- For swimming pools with circulation capacity of up to 225 m³



DULCODOS® Pool Professional

In addition to the features described above, DULCODOS® Pool Professional also measures the combined chlorine. This is an important parameter in public pools. It can be incorporated in the building management system via Modbus RTU and alarm messages can be sent by e-mail. Eco!Mode reduces the amount of energy consumed by the filter pumps.

The swimming pool controller becomes the central control unit for all the swimming pool technology.

- For swimming pools with circulation capacity of up to 1,130 m³

Transmitter DULCOMETER® and controller DULCOMETER® Compact

Simple and compact



Transmitters

DULCOMETER® DMT

DULCOMETER® transmitters of type DMT are compact two-wire transmitters for use with the measured variables of pH, ORP, chlorine, conductive conductivity and temperature. They convert the primary sensor signal into a standard 4-20 mA signal and enable disturbance-free connection of the sensor to remote controllers (e.g. PLC Programmable Logic Controller) or DULCOMETER® controllers.

- With display and calibration of the measured value at the location of the sensor
- Optional connection to PROFIBUS® DP

Basic controller

DULCOMETER® Compact

The DULCOMETER® Compact controller for the measured variables of pH, ORP, chlorine, conductive and inductive conductivity is supplied with the standard functions for basic applications in water treatment. The measured variables of pH and ORP are available in a single controller and can easily be selected. Operation is language-independent.

Measured variable	Measuring and adjustment range
pH value	0-14
ORP	-1,000–1,000 mV
Chlorine	0.05–5 ppm
Conductive conductivity	0.5 µS/cm–20 mS/cm (auto-ranging)
Inductive conductivity	20 µS/cm - 2000 mS/cm

Controller

DULCOMETER® D1Cb/D1Cc

Universal standard



Controller

DULCOMETER® D1Cb/D1Cc

The controllers DULCOMETER® D1Cb (wall-mounted) and D1Cc (control cabinet installation) are the standard controllers for applications in potable water, waste water and cooling water treatment. Its basic model is equipped with 14 measured variables.

- Sensor monitoring and safety function to prevent incorrect metering
- 22 operating languages in the controller
- 14 measured variables selectable from the menu

Key applications

- Potable water and waste water treatment
- Industrial and process water treatment
- Swimming pool water treatment

Measured variables

- pH/ORP
- Conductive conductivity via mA
- Chlorine dioxide
- Chlorine
- Chlorite
- Ozone
- Fluoride
- Hydrogen peroxide
- Peracetic acid
- Dissolved oxygen
- Temperature
- Analogue signal

Controller DULCOMARIN®

Multi-parameter controller diaLog DACb

Intelligent control



Controller

DULCOMETER® diaLog DACb

The new two- or three-channel multi-parameter controller diaLog DACb was specially developed for the continuous measurement and control of parameters needed in liquid analysis. Sensors from 14 freely selectable measured variables can be connected per channel.

The standard field buses are available for communication with the control level. The incorporated data, calibration and event logger records all measured values, control variables, digital inputs, calibration values, warning and error messages on the SD card with a time stamp. The diaLog DACb controller uses intelligent controller functions to complete the control circuit between ProMinent DULCOTEST® sensors and ProMinent® metering pumps, offering special functions as required in water treatment.

- Three 2-page PID controllers
- Integral data logger with SD card
- Disturbance variable processing (flow) as standard
- pH compensation for chlorine as standard
- Various field buses

Key applications

- Potable water and waste water treatment
- Industrial and process water treatment
- Swimming pool water treatment

Measured variables

- pH/ORP
- Bromine
- Conductive conductivity
- Chlorine dioxide
- Chlorine
- Chlorite
- Ozone
- Fluoride
- Hydrogen peroxide
- Peracetic acid
- Dissolved oxygen
- Temperature
- Analogue signal



Advanced controller

DULCOMARIN® 3

The multi-parameter, multi-channel measurement and control system DULCOMARIN® 3 guarantees complete transparency of all measurement and control processes within networked systems. As the world's first bus system for potable water treatment and swimming pool engineering, it networks sensors and actuators at the field level. DULCOMARIN® 3 can be easily operated via a large 7" touch display and can control up to 16 filtration circuits. Modbus RTU and LAN are available for communication with the superordinate systems (e.g. building management systems) as standard. Wi-Fi is optional. Remote control uses a VNC app.

Measured variables

- pH value
- ORP
- Free chlorine
- Total available chlorine
- Combined chlorine

Sensors for pH/ORP and fluoride sensor technology

DULCOTEST® potentiometric sensors

Application-optimised measurements

pH and ORP

The DULCOTEST® range of pH and ORP electrodes provides a wide range of options for solving key measurement tasks in the monitoring and treatment of different types of water. The fields of application cover everything from simple water treatment tasks through to complex industrial process applications with stringent requirements in terms of temperature, pressure, contamination tolerance and chemical resistance.

Fluoride

Ion-selective electrodes are offered in two measuring ranges to measure fluoride for potable and waste water applications.



- Excellent durability thanks to high-end glass quality (pH) and the optimum combination of automated and manual manufacturing
- Precise and reliable measurement for efficient processes and maximum process safety
- Custom process integration through special designs with individual fitting lengths, cable lengths and plugs available
- Optimum operational lifetime yield for electrodes thanks to rapid delivery and short storage duration
- Ultra-simple installation and maintenance by means of rotating cable connection, with fixed cable and plug-in versions

Medium	Temperature / pressure	Sensor type	Application
clear, pH 3–14	max. 100°C, 3 bar max. 25 °C, 6 bar	PHEP-H	Chemical processes
clear, pH 2–12	max. 80°C, no overpressure	PHEN	Chemically contaminated water Low-conductivity water >50 µS/cm
		RHEN	Chemically contaminated water Low-conductivity water >50 µS/cm
	max. 60 °C, 3 bar	PHEs	Swimming pool water, potable water (glass shaft)
		PHEK	Swimming pool, aquarium (plastic shaft)
		RHEs	Swimming pool water, potable water (glass shaft)
		RHEK	Swimming pool, aquarium (plastic shaft)
	max. 80 °C, 6 bar	PHEP/PHEPT	Process water
		RHEP-Pt	Process water
		RHEP-Au	Chemically contaminated water, e.g. CN ⁻ , ozone treatment
	max. 80 °C, 8 bar	PHED	Chemically contaminated water, e.g. Cr ⁶⁺ , CN ⁻
Solid residues, turbidity	max. 80 °C, 6 bar	PHER/PHEI	Cooling water, waste water
		RHER/RHEIC	Cooling water, waste water
Solid residues, not transparent	max. 80 °C, 6 bar	PHEX	Suspensions, sludge, emulsions
		RHEX	Suspensions, sludge, emulsions
Clear, containing fluoride, pH < 5	max. 50 °C, 7 bar	PHEF	Exhaust air scrubber, semiconductor industry, electroplating

Sensors for disinfectants and oxidising agents

DULCOTEST® amperometric sensors

Maximum process reliability thanks to innovation

Amperometric sensors in the DULCOTEST® product range provide measured values for the most diverse disinfectants, such as chlorine, bromine, chlorine dioxide, ozone and their resulting by-products. The selective and precise measured values guarantee maximum process reliability and are available round the clock for monitoring or control in real time.

ProMinent sets new standards in sen-

sor technology: Innovative sensors, such as those for chlorite, total chlorine, peracetic acid, hydrogen peroxide and the contamination-tolerant xxR types, open up whole new applications. The sensors are available with a broad spectrum of measuring ranges, various designs and connection versions for DULCOMETER® controllers as well as custom versions for special applications.



Measured variable	Applications	Graduated measuring ranges	Connection to DULCOMETER®	Sensor type
Free chlorine	Potable water, swimming pool water	0.01 – 100 mg/l	D1C, DAC	CLE 3-mA-xppm, CLE 3.1-mA-xppm
	Process and waste water	10 – 200 mg/l	D1C, DAC	CLR 1-mA
	Potable water, swimming pool water	0.01 – 10 mg/l	DULCOMARIN®	CLE 3-CAN-P-xppm, CLE 3.1-CAN-P-xppm
	Potable water, swimming pool water, in-situ electrolysis (without diaphragm)	0.02 – 10 mg/l	D1C, DAC, AEGIS II	CLO 1-mA-xppm
	Swimming pool water, uncontaminated potable water and process water; can also be used together with diaphragm-free electrolysis processes	0.01 – 10 mg/l	DULCOMARIN®	CLO 1-CAN-P-10ppm
	Hot water up to 70 °C (legionella), in situ electrolysis (without diaphragm)	0.02 – 2 mg/l	D1C, DAC, AEGIS II	CLO 2-mA-2ppm
	Potable water, swimming pool water	0.01 – 50 mg/l	DMT	CLE 3-DMT-xppm
		0.05 – 5 mg/l	COMPACT	CLB 2-µA-xppm
		0.05 – 5 mg/l	COMPACT	CLB 3-µA-xppm
Total available chlorine / free chlorine	Cooling water, process water, waste water, water with higher pH values (stable); seawater (free chlorine exists as bromine)	0.01 – 10 mg/l	D1C, DAC, AEGIS II	CBR 1-mA-xppm
	Swimming pool water with organic chlorine disinfectants and in situ electrolysis (without diaphragm)	0.02 – 10 mg/l	D1C, DAC, AEGIS II	CGE 3-mA-xppm
		0.01 – 10 mg/l	DULCOMARIN®	CGE 3-CAN-P-xppm
Total chlorine	Potable water, industrial water, process water and waste water	0.01 – 10 mg/l	D1C, DAC, AEGIS II	CTE 1-mA-xppm
		0.01 – 10 mg/l	DMT	CTE 1-DMT-xppm
		0.01 – 10 mg/l	DULCOMARIN®	CTE 1-CAN-P-xppm
Combined chlorine	Swimming pool water	0.02 – 2 mg/l	DAC	CTE 1-mA-2 ppm and CLE 3.1-mA-2 ppm
		0.01 – 10 mg/l	DULCOMARIN®	CTE 1-CAN-P-xppm and CLE 3.1-CAN-xppm
		0.01 – 10 mg/l	D1C, DAC	BCR 1-mA-xppm (replaces earlier type BRE 1)
Total available bromine	Cooling water, waste water, swimming pool, spa pool water, bromine with BCDMH	0.01 – 10 mg/l	D1C, DAC	BCR 1-mA-xppm (replaces earlier type BRE 1)
	Cooling water, swimming pool water, spa pool water with organic or inorganic bromine compounds	0.02 – 10 mg/l	DULCOMARIN®	BRE 3-CAN-10ppm
Free and combined bromine	Cooling water, process water, waste water, water with higher pH values (stable); seawater	0.02 – 20 mg/l	D1C, DAC, AEGIS II	CBR 1-mA-xppm
		0.02 – 20 mg/l	DULCOMARIN®	CBR 1-CAN-P-10 ppm
Chlorine dioxide	Potable water	0.01 – 10 mg/l	D1C, DAC	CDE 2-xppm
	Bottle washing system	0.02 – 2 mg/l	D1C, DAC	CDP 1
	Hot water up to 60 °C, cooling water, waste water, irrigation water	0.01 – 10 mg/l	D1C, DAC, DULCOMARIN®	CDR 1-xppm, CDR 1-CAN-xppm
	Potable water, washing water	0.02 – 2 mg/l	D1C, DAC, DULCOMARIN®	CLT 1-mA-xppm, CLT 1-CAN-xppm
Ozone	Potable water, swimming pool water	0.02 – 2 mg/l	D1C, DAC	OZE 3-mA-2 ppm
	Process water, industrial water, cooling water	0.02 – 2 mg/l	D1C, DAC	OZR 1-mA-2 ppm
Dissolved oxygen	Aeration tanks, clarification plants, fish farming, potable water, surface water	0.1 – 20 mg/l	D1C, DAC	DO 3-mA-xppm
	Aeration tanks, clarification plants	0.05 – 10 mg/l	D1C, DAC	DO 2-mA-xppm
Peracetic acid	CIP (cleaning in place), aseptic foodstuff filling	1 – 2,000 mg/l	D1C, DAC, AEGIS II	PAA 1-mA-xppm
Hydrogen peroxide	Clear water, fast control	1 – 2,000 mg/l	DAC	Perox sensor, PEROX-H2.10 P
	Process water, swimming pool water	0.5 – 2,000 mg/l	D1C, DAC	PER1-mA-xppm

Conductivity sensors DULCOTEST®

Turbidity measuring points DULCO® turb C

Versatile and precise



Conductivity sensors

DULCOTEST®

The broad range of DULCOTEST® conductivity sensors offers the perfect choice of sensor with optimum cost-effectiveness for any task, from simple water treatment through to complex industrial process water applications.

- 26 different sensor types for a broad range of requirements: measuring range, temperature, pressure, chemical resistance, contamination tolerance and process integration
- From simple conductometric 2-electrode sensors to inductive high-end sensors
- Precise and reliable measurement enables efficient processes and maximum process reliability
- High operational service life and long maintenance intervals reduce downtime and increase the availability of the measured values
- Complete pre-assembled kits containing fitting and sensor for easy, fast and error-free installation

Turbidity measuring points

DULCO® turb C

The DULCOTEST® measuring points for turbidity DULCO® turb C, which come in the TUC1, TUC2, TUC3 and TUC4 versions, are compact online turbidity measuring points, comprising sensor, flow fitting and measuring device.

They are used primarily in potable water treatment applications for all treatment stages, from raw water monitoring and filter monitoring through to measurement of fine turbidity in dispensed potable water at 0.02 NTU (FNU).

Further applications include the turbidity monitoring service water and waste water with slight contamination as well as water to be treated from the food and beverage industry up to turbidity values of 1,000 NTU.

- Depending on the selected design, the system conforms to the worldwide standard ISO 7027 and the European standard DIN EN 27027 or the US standard USEPA 180.1
- Optionally available with sample cell ultrasonic cleaning system

First-class measuring and control technology for an exclusive wellness experience



"A premium classspa"

The Dolder Grand Hotel & "Curhaus" in Zurich is among the most beautiful wellness hotels in Switzerland. The water treatment technology provided by ProMinent is a major contributor to ensuring that the exclusive experience in this breathtaking spa remains unforgettable.

Pumps and controllers from ProMinent ensure effective disinfection and neutralisation of the pool water in the gigantic 4,000 m² spa.

The water for the swimming pool, whirlpools and aroma pools is efficiently treated in multiple stages using seven separate circuits. The control signals to all the metering pumps are sent via LAN from the central control unit DULCOMARIN® II DULCO®-net, which forms the "brains" of the water treatment system. In an interview, Carsten Behr, Director of Engineering for the spa area, gives his assessment of the control system.

Mr Behr, what is the purpose of the DULCOMARIN® II DULCO®-net in your facility?

Carsten Behr: "The innovative controller from ProMinent is responsible for accurately controlling all the metering pumps in the system and displaying all the relevant information for the operator."

How does this affect the water quality?

Carsten Behr: "The safe and controlled neutralisation and disinfection in the Aqua Zone of the Dolder Grand ensures that premium water quality is guaranteed around the clock."

Do you benefit in any other ways?

Carsten Behr: "Our running costs are reduced in two ways: firstly due to the minimal use of chemicals and secondly due to automated water care, which is achieved through the integration and connection of intelligent measuring, control and metering technology within the higher-level process control system."

Service



Global service locally

You can benefit from ProMinent's services even if you are not yet our customer.

Our pre-sales service will ensure that you obtain the optimum solution to meet your individual needs.

Thanks to our worldwide presence in over 100 countries, our service is available wherever you need it.

- Advice on product selection
- Application and process optimisation
- Project planning

However, our commitment does not end with delivery. We also provide you with a comprehensive after-sales service, which lasts for the entire service life of your equipment. This maximises your productivity and minimises your operating costs.

- Assembly/installation
- Commissioning
- Maintenance
- Spare parts service
- Repairs
- Troubleshooting

Worldwide contacts



Ready for you. Any time, anywhere.

ProMinent is at home in more than 100 countries across the globe. This guarantees the worldwide availability of our products and comprehensive expertise on the ground with close proximity to the customer. We offer the same high quality standards for our solutions and services all over the world. And we work day in, day out to keep our promise: Ready for you. Any time, anywhere.

You can find the contact details of local branches and agencies at www.prominent.com/en/locations

You can find the ProMinent app for iPad and iPhone in the iTunes App Store or at www.prominent.com/app



ProMinent Group

info@prominent.com
www.prominent.com

Certificate

PROFIBUS Nutzerorganisation e.V. grants to

ProMinent GmbH

Im Schuhmachergewann 5-11, 69123 Heidelberg, Germany

the Certificate No: **Z12322** for the PROFINET Device:

Model Name: DULCOMETER diaLog DACb
Revision: SW/FW: V2.0.14.0; HW: 2
Identnumber: 0x0143; 0x0001
GSD: GSDML-V2.32-Prominent-DACb-PRT2P-20180202.xml
DAP: RT, 0x80010000

This certificate confirms that the product has successfully passed the certification tests with the following scope:

☒ PNIO_Version	V2.32
☒ Conformance Class	C
☒ Optional Features	Legacy, MRP
☒ Netload Class	III
☒ PNIO_Tester_Version	Version 2.33.0
☒ Tester	Siemens AG, Fürth, Germany; PN524-1

This certificate is granted according to the document:

“Framework for testing and certification of PROFIBUS and PROFINET products”.

For all products that are placed in circulation by **September 03, 2021** the certificate is valid for life.

Karlsruhe, September 21, 2018



(Official in Charge)

Board of PROFIBUS Nutzerorganisation e. V.



(Karsten Schneider)



(Dr. Jörg Hähnliche)



Metering System DULCODOS® eco (DSBa)

Choose from a range of different components and adapt the metering system to your requirements.



Two hydraulic connection points guarantee simple installation of the metering system. The ready mounted system consists of components that have been perfectly matched to each other to ensure problem-free operation. You obtain a

complete system. Individually configure your metering system at the time of ordering. A simple selection system makes ordering easy and guarantees maximum efficiency even at the time of ordering.

Your benefits

- One to three metering pumps mounted on a storage tank, ready for connection with all the necessary accessories
- Short delivery time
- Outstanding value for money
- Compact construction
- Fast commissioning
- Versatile use

Field of application

Treatment of cooling, process and swimming pool water

Metering System DULCODOS[®] eco (DSBa)

Choose from a range of different components and adapt the metering system to your requirements.

Technical Data

ProMinent metering systems with PE storage tanks can be selected and ordered with the help of an identity code system. First select the metering pump using the separate pump identity code.

Selectable components

1. PE dosing tank (35 – 1,500 litres)
2. Stackable collecting pans (35 – 1,500 litres)
3. Lock for tank screw top
4. Hand mixer/stirrer (*)
5. Suction assembly
6. Level switch for suction assembly
7. Drain tap for storage tank (*)
8. Order metering pump (*) separately (Order the pump separately due to the large number of possible pumps that can be installed on storage tanks. Use the identity code for the pump you require.)

* These components are ready for subsequent installation, but are supplied separately to avoid damage in transit. Customers should fully install the system on site.



ISOMAG 

The friendly magmeter

DATA SHEET

MV110



CE

ISOIL 
I N D U S T R I A



INDEX

DATE TEHNICE	1
DIMENSIUNI	2
MV110 ASPECT DETALIAT	4
VIZUAL PAGINI PRINCIPALE	5
CONEXIUNE ELECTRICĂ	6
IEȘIRI DIGITALE	7
IEȘIRI ANALOGIC	7
INTRARE DIGITALĂ	7
MENIU FUNCȚII	8
ACURATETE	12
CUM COMAND	13

DATE TEHNICE

DATE GENERALE

Utilizabil pentru	☐ toate tipurile de senzor ISOMAG
Conductivitate minimă	☐ 5 μ S/cm
Altitudine	☐ -200 m up to 4000 m
Temperatura ambiantă	☐ -20... +60°C / -4... +140 °F - Aluminium housing ☐ -10... +50°C / -4... +104 °F - Reinforced Nylon
Umiditate	☐ 0÷100%

DATE STANDARD

Material carcasă	☐ Aluminu vopsit ☐ Plastic cu fibră de sticlă
Grad de protecție	☐ IP 67
Alimentare/Consum	☐ 100-240 V~ (20VA) – 44-66 Hz
Cabluri	☐ N° 5 glanda cabluri PG
Valoare scală	☐ 0,4...10m/s
Dig. Input	☐ N°1 , programabil (ex. Totalizer reset)
Memo date	☐ Memorare în caz de lipsă alimentare
Izolare galvanică	☐ Toate intrările/ieșirile sunt izolate de alimentare până la 250 V
Programare	☐ port USB pentru conexiune la PC (cablu USB tip A/USB MINI B is required for the programming)
Bi-Directional	☐ Yes
Diagnostic Funct.	☐ Yes
Detectie conductă goală	☐ Yes
CE Certification	☐ Yes

OPTIONALE

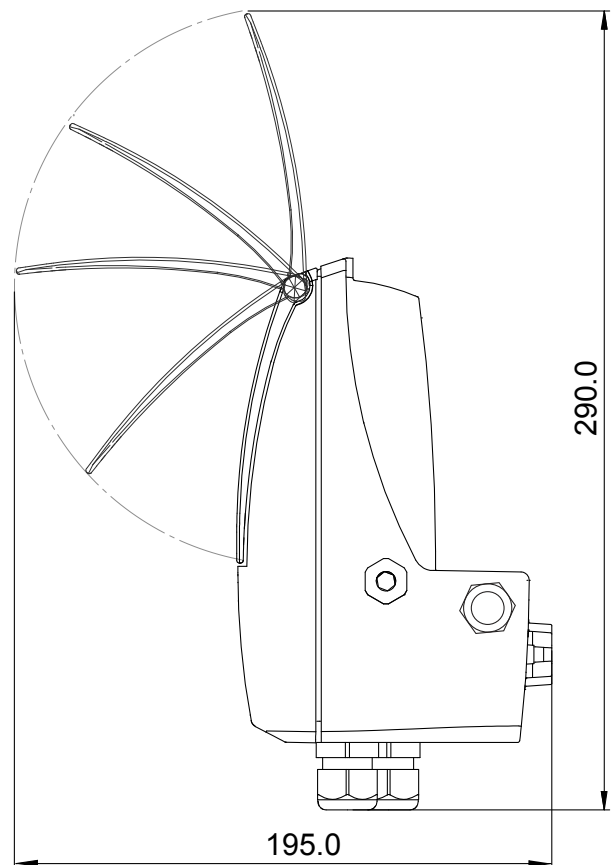
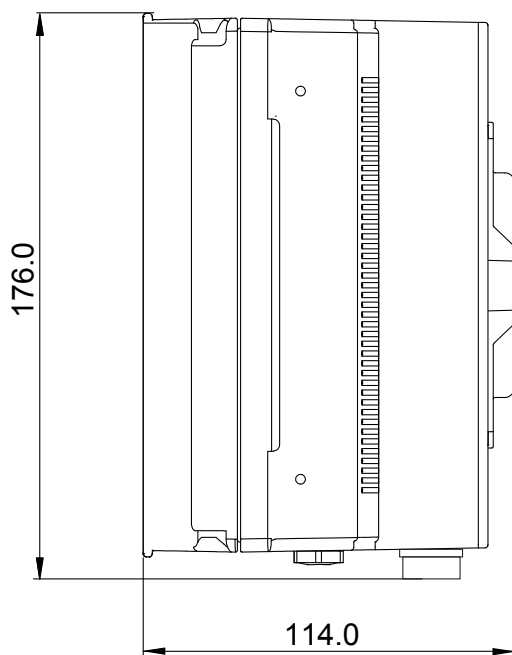
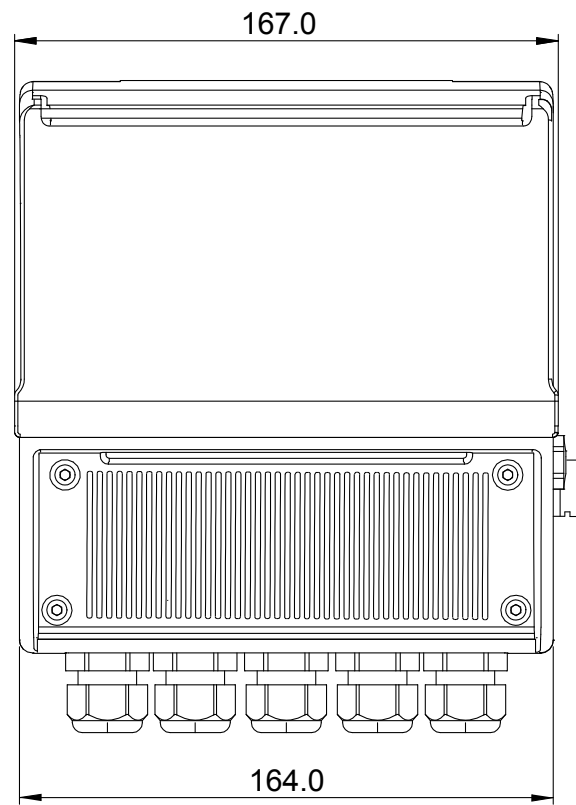
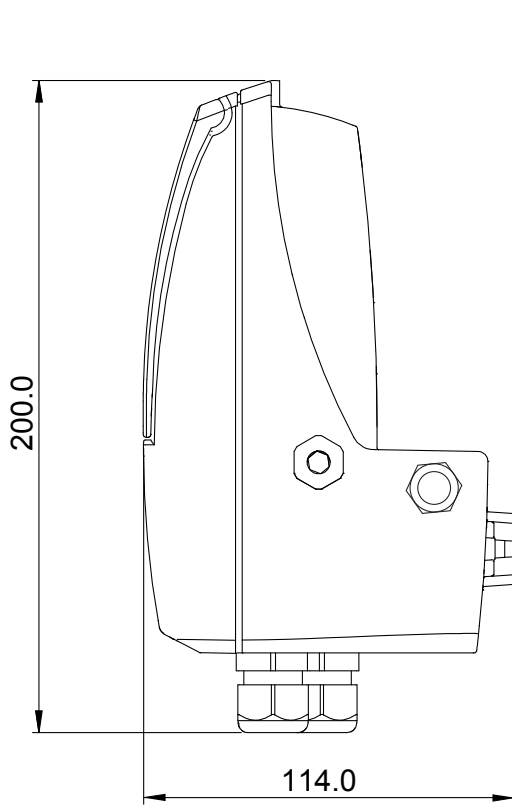
Versiune	☐ Compact ☐ Separate
Grad de protecție	☐ IP 68
Con.cablu pt.versiune separată	☐ CABLU C014
LCD Display	☐ Graphic display 128x64 pixels back light, 3 programming keys
Alimentare/Consum	☐ Power supply : 100 ... 240 VAC 44/66 Hz ☐ Power supply : 24 ... 36 VAC/VDC 0...45/66 Hz ☐ Power supply : 12...48 VDC ☐ Power supply : 100 ... 240 VAC 44/66 Hz + 1 Rechargeable Battery ☐ Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz + 1 Rechargeable Battery ☐ Power supply : 12...48 VDC + 1 Rechargeable Battery
Ieșire puls/alarmă	☐ N°1 digital Output , 1250 Hz, 100mA, 30 Vdc ☐ N°2 digital Outputs , 1250 Hz, 100mA, 30 Vdc
Ieșire analogică	☐ n° 1 Analogue output 0/4...20/22 mA (Hart optional) ☐ n° 2 Analogue outputs 0/4...20/22 mA (Hart optional over Out.1)
Port comunicare	☐ RS 485 ☐ Wi-Fi (pt. programare)
Data Logger	☐ MicroSD Memory Card 4...32 GBytes
Protocol	☐ Modbus over RS 485 ☐ HART (Available on analog output n° 1)

PRECIZIE

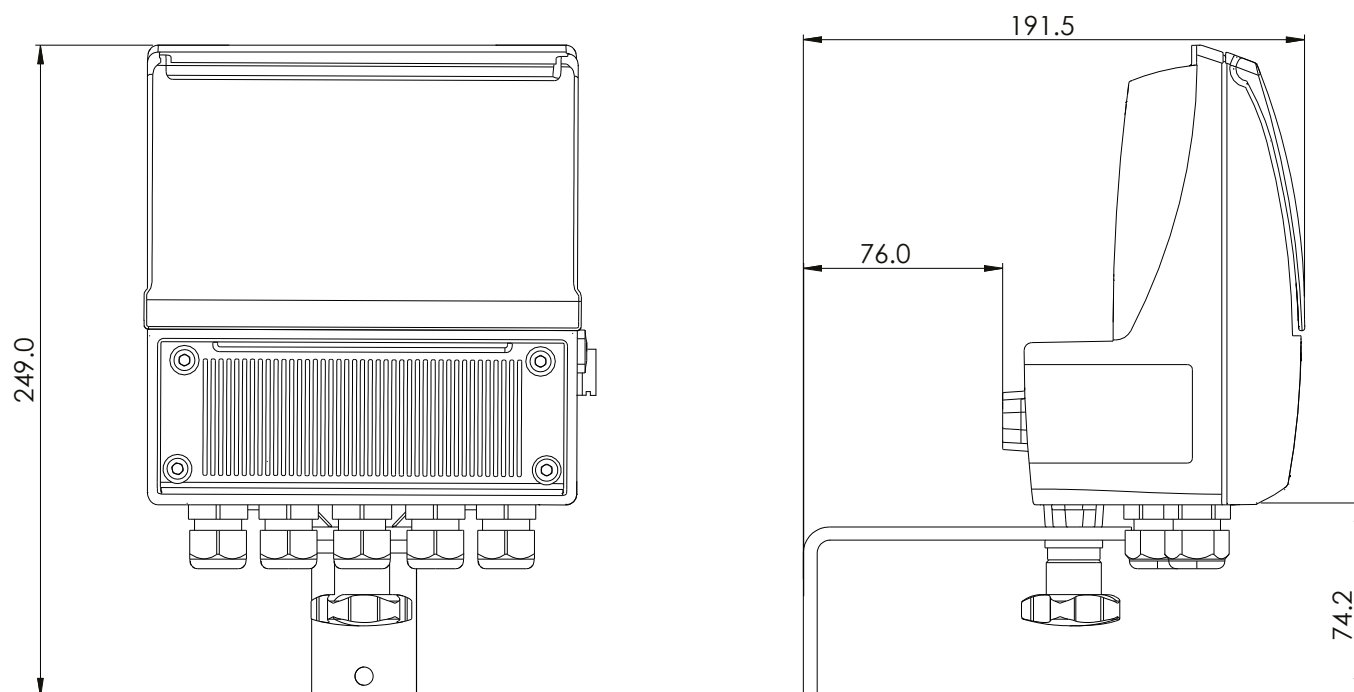
Precizie	☐ Flow rate (volume) = $\pm 0,05\%$ v.l. ☐ Out 4/20 mA = $\pm 0,08\%$ v.l. ☐ Frequency Out = $\pm 0,08\%$ v.l.
Accuratețe (pentru întreg sistem:senzor + contoler)	☐ Vezi tabelul de mai jos

DIMENSIUNI

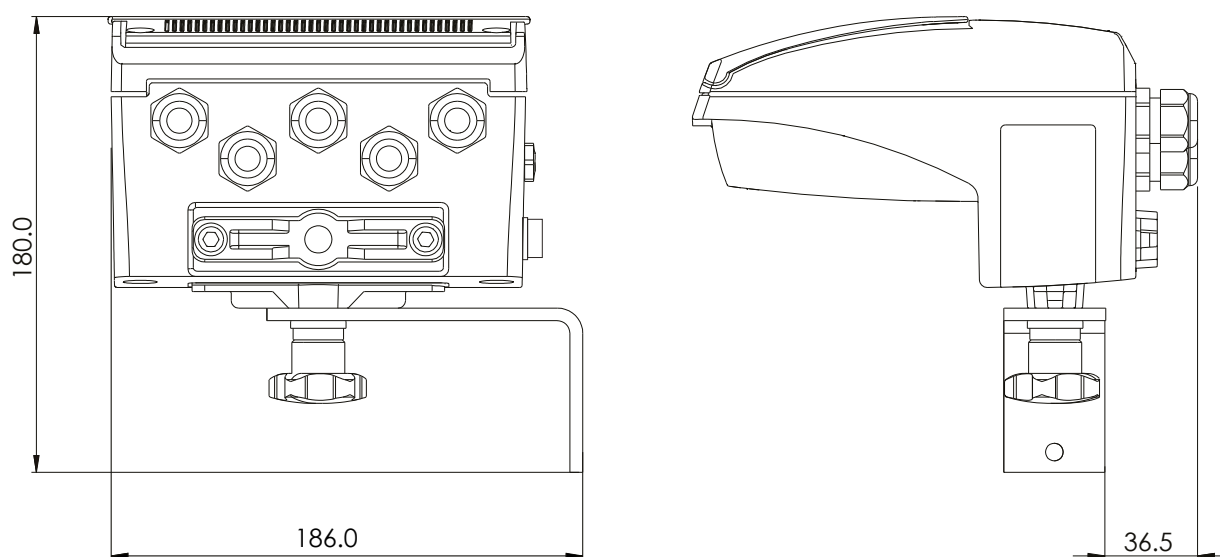
COMPACTĂ



SEPARATĂ (PERETE)

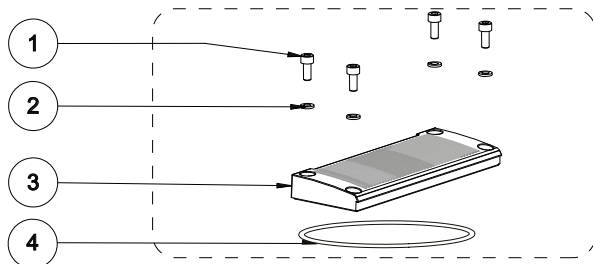


ROTABILĂ (PERETE)

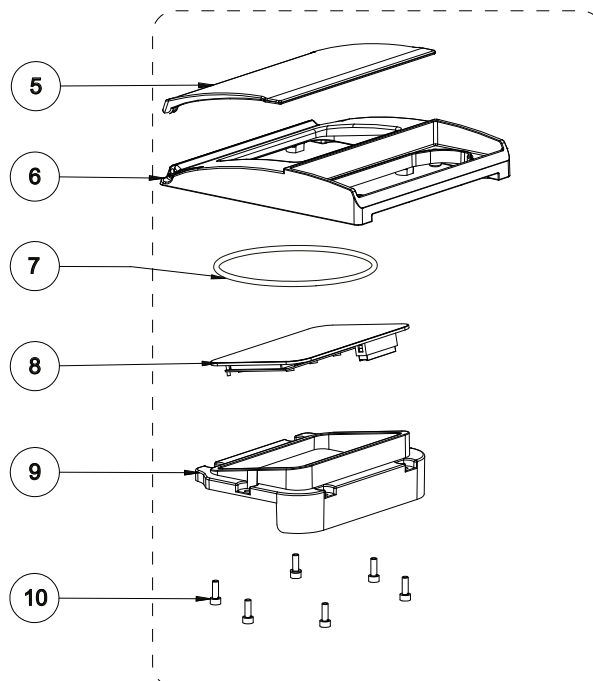


■ MV110 ASPECT DETALIAT

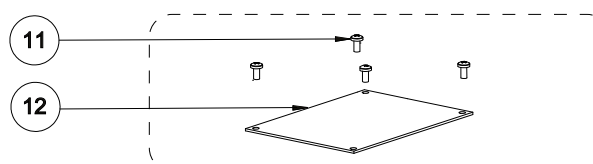
COPERTĂ BLOC TERMINALE



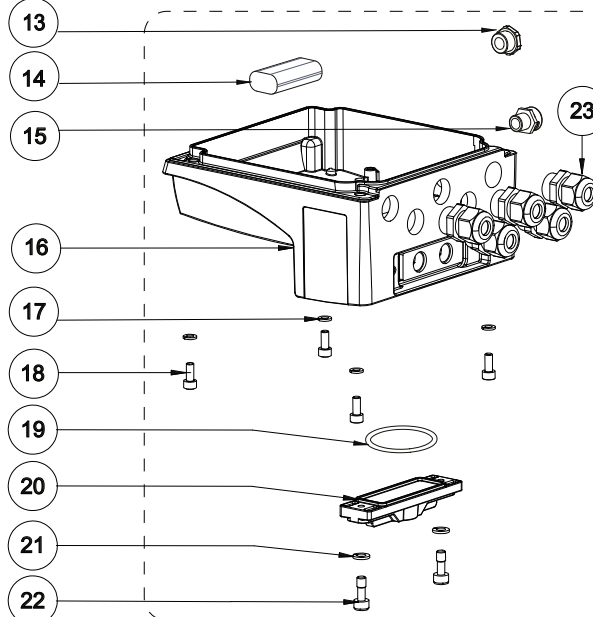
COPERTĂ CARCASĂ



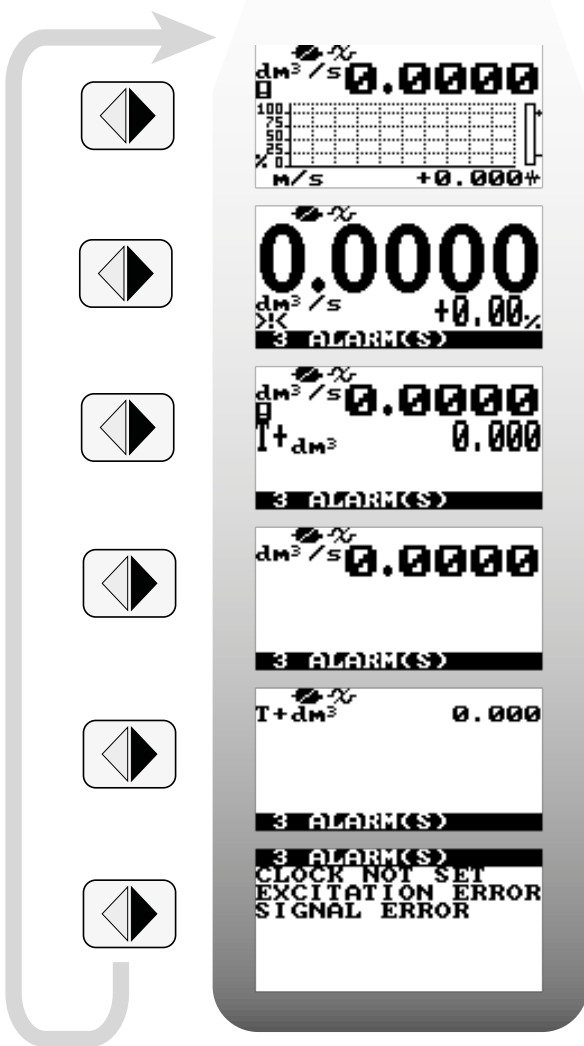
PCB MV110



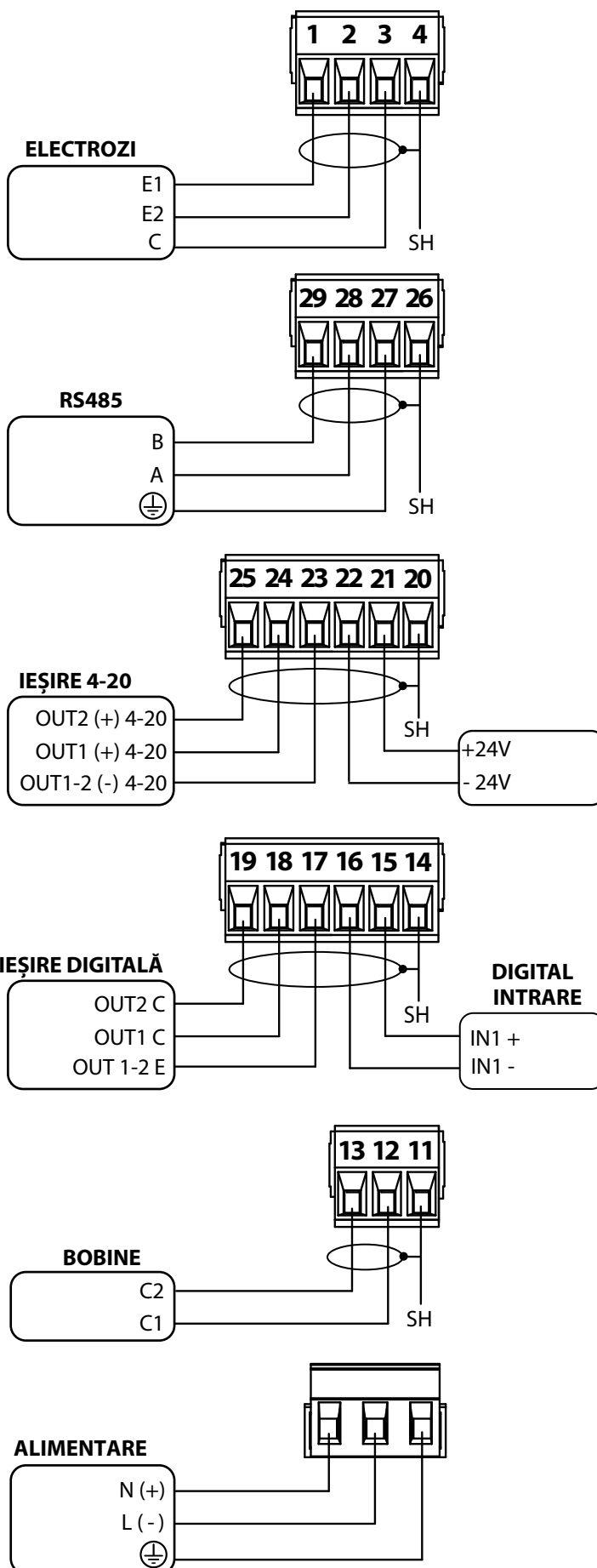
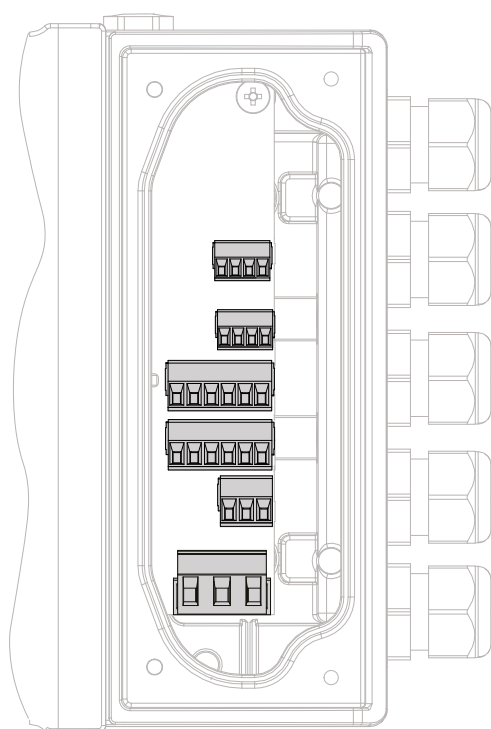
CARCASĂ PRINCIPALĂ



POS.	DESCRIERE	
	PA6 VERSION	ALUMINIUM VERSION
1	ȘURUB M4x12	SCREW M5x12
2	ȘAIBĂ Ø4	GROWER Ø5
3	COPERTĂ BLOC TERM.	TERMINAL BLOCK COVER
4	ORING-4400	
5	ECRAN PROTECȚIE	
6	COPERT.CARCASĂ	HOUSING COVER
7	ORING-4700	
8	DISPLAY	
9	CADRU FIXARE DISPLAY (MATERIAL PA06)	
10	ȘURUB AUTOFILETANT4x10	ȘURUB TRILOBO 4x10
11	ȘURUB AUTOFILETANT4x10	ȘURUB TRILOBO 4x10
12	PCB MV110	
13	PG9 CAP	
14	LITHIUM BATTERY	
15	ANTICONDESE CAP	
16	PA6 CARCASĂ	CARCASĂ ALUMINIU
17	ȘAIBĂ Ø4	GROWER Ø5
18	ȘURUB M4x12	SCREW M5x12
19	ORING-155	
20	VERSION CAP (MATERIAL PA06)	
21	ȘURUB M6x16	
22	ȘAIBĂ Ø6	
23	PRESETUPĂ PG11	

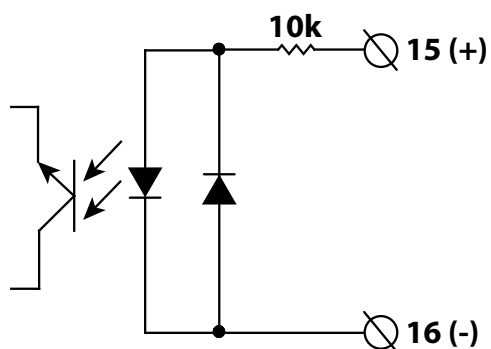


CONEXIUNE ELECTRICĂ

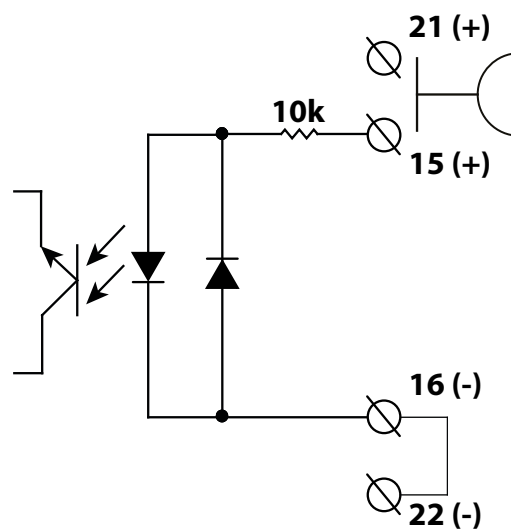


INTRARE DIGITALĂ

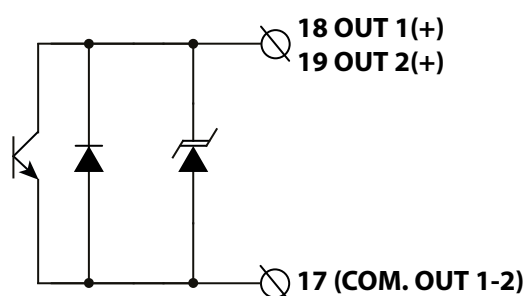
INTRARE ON/OFF (ALIMENTARE EXTERNĂ)



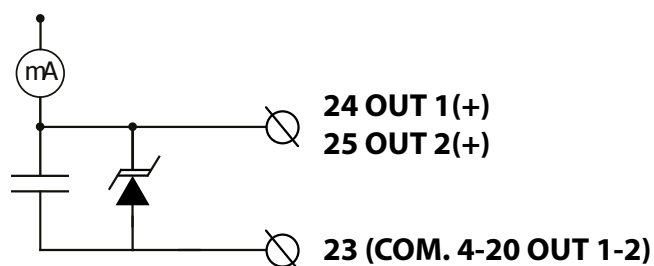
INTRARE ON/OFF (ALIMENTARE INTERNĂ)



IEȘIRE DIGITALĂ



IEȘIRE ANALOGICĂ



MENIU FUNCȚII

```

MAIN MENU
1-Sensor
SENSOR
S.model= 0041
Lining= UNSPEC.
S.type= FULL BORE
U.type= METRIC
Diam.=mm 700
KA= +04.4914
KZ= -0018852
Ins.position= 0
KP dynamic= OFF
Ki= +01.0000
Kp= +01.0000
KC= 1.000000
C.Curr.=mA 025.0
C.Reg.PB= 007
C.Reg.DK= 013
S.Freq.=Hz 50
E.P.Detect= ON
R.max=kohm 0500
El.cleaning AUG
S.cable=m 000
S.err.delay= 010
Sens.verify= OFF
Zero point cal.

```

- 1.1 Model senzor: Introduceți primele 2 caractere din număr serie senzor
- 1.2 Căptușeală senzor
- 1.3 Type of sensor: fullbore or insertion
- 1.4 Unitate de măsură senzor: metric sau not metric
- 1.5 Introduceți ND a senzorului (0-2500)
- 1.6 Valoare de calibrare a senzorului de pe etichetă
- 1.7 Coeficient KZ a senzorului
- 1.8 Insertion position
- 1.9 KP dynamic, coefficient for insertion
- 1.10 Sensor coefficient Ki
- 1.11 Sensor coefficient Kp
- 1.12 Sensor coefficient KC
- 1.13 Sensor excitation current
- 1.14 Current regulator proportional band
- 1.15 Current regulator derivation constant
- 1.16 Measure sampling frequency
- 1.17 selectare mod detectare conductă goală
- 1.18 Empty pipe detection threshold
- 1.19 Curățire electrozi
- 1.20 Lungime cablu până la senzor
- 1.21 Întârziere mesaj eroare (n. sample)
- 1.22 Validare verificare automată senzor
- 1.23 Calibrare zero pentru condiții hidraulice

```

MAIN MENU
1-Sensor
2-Units
UNITS
Diam.= mm
S.cable= m
FR.unit= METRIC
Pl1 unit= METRIC
Pl2 unit= METRIC
T+ unit= METRIC
T- unit= g
T+ D.P.= 3
P+ unit= METRIC
P- unit= g
P+ D.P.= 3
T- unit= METRIC
T- unit= g
T- D.P.= 3
P- unit= METRIC
P- unit= g
P- D.P.= 3
Temp.unit= °C
Mass units= ON
Sg=kg/dm³ 1.0000

```

- 2.1 Diametru nominal
- 2.2 Lungime cablu la versiunea separată
- 2.3 Unitate de măsură debit: metric sau not metric
- 2.4 Pulse 1 type measure unit: metric or not metric
- 2.5 Pulse 2 type measure unit: metric or not metric
- 2.6 Unitate de măsură Total direct totalizer: metric sau not metric
- 2.7 Unitate de măsură Total direct totalizer
- 2.8 Poziția punctului zecimal Total direct totalizer
- 2.9 Partial direct totalizer measure unit type: metric or not metric
- 2.10 Partial direct totalizer measure unit
- 2.11 Partial direct totalizer decimal point position
- 2.12 Total reverse totalizer measure unit type: metric or not metric
- 2.13 Total reverse totalizer measure unit
- 2.14 Total reverse totalizer decimal point position
- 2.15 Partial reverse totalizer measure unit type: metric or not metric
- 2.16 Partial reverse totalizer measure unit
- 2.17 Partial reverse totalizer decimal point position
- 2.18 Unitate de măsură temperatură
- 2.19 Selectare/deselectare greutatei specifice pe toată scală 2.20 Specific gravity coefficient

```

MAIN MENU
1-Sensor
2-Units
3-Scales
SCALES
FS1= g/s 4908.7
FS2= g/s 4908.7
Pls1=g 1000.00
Tpls1=ms 0050.0
Pls2=g 1000.00
Tpls2=ms 0050.0
Frq1=Hz 1000.0
Frq2=Hz 1000.0

```

- 3.1 Debit pe toată scala 1
- 3.2 Full scale flow rate 2
- 3.3 Pulse value on channel 1
- 3.4 Duration of the pulse generated on channel 1
- 3.5 Pulse value on channel 2
- 3.6 Duration of the pulse generated on channel 2
- 3.7 Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
- 3.8 Full scale frequency for channel 2 (0.1Hz-1000.0Hz)

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
MEASURE
Damping= SMART
Cut-off=% 00.1
Cal.verify= ON
Autorange= ON

```

- 4.1 Filtru de măsură
- 4.2 Prag pentru debit mic: 0-25% din toată scala
- 4.3 Verificarea calibrării automate
- 4.4 Schimbare automată a domeniului de măsură

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
ALARMS
Max.thr+=% 000
Max.thr-=% 000
Min.thr+=% 000
Min.thr-=% 000
Hysteresis=% 03
mA v.alarm=% 000
Hz v.alarm=% 000

```

- 5.1 Alarma pentru valoarea maximă scurgere directă
- 5.2 Alarma pentru valoarea maximă scurgere inversă
- 5.3 Alarma pentru valoarea minimă scurgere directă
- 5.4 Alarma pentru valoarea minimă scurgere inversă
- 5.5 Prag de histereză pentru alarmă debit minim și maxim
- 5.6 Valoarea curentului de ieșire în caz de eroare
- 5.7 Frequency output value in case of alarms

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
INPUTS
I+ reset= OFF
P+ reset= OFF
T- reset= OFF
P- reset= OFF
Count lock= OFF
Meas.lock= OFF
Calibration= OFF
Range change= OFF

```

- 6.1 Total direct (positive) flow totalizer reset enable
- 6.2 Partial direct (positive) flow totalizer reset enable
- 6.3 Total reverse (negative) flow totalizer reset enable
- 6.4 Partial reverse (negative) flow totalizer reset enable
- 6.5 Totalizer counting lock command
- 6.6 Measure zero lock command
- 6.7 Calibration external command
- 6.8 Range change external command

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
OUTPUTS
Out1= PULSES
Out2= PULSES
Out mA1=4.22 +/-
Out mA2=4.22 +/-
A1S=dm³/s 4.9087
A2S=dm³/s 4.9087

```

- 7.1 Output 1 functions
- 7.2 Output 2 functions
- 7.3 Choice of the function and the range of current output n.1
- 7.4 Choice of the function and the range of current output n.2
- 7.5 Full Scale value for analog out1
- 7.6 Full Scale value for analog out2

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
COMMUNICATION
HART Pk= 05
Dev. Addr= 001
13-System

```

- 8.1 HART packet byte preambles
8.2 Device communication address number

```

DISPLAY
Language= I
Contrast= 5
Disp.time=s 020
D.rate=Hz 5
Disp.fn.= 1
Disp.lock= ON
Part.tot.= ON
Neg.tot.= ON
Net tot.= ON
Disp.date= ON
Quick start= ON
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System

```

- 9.1 Choice of the language: E= English, I=italian
9.2 Display contrast
9.3 Display/keyboard inactivity time
9.4 Display updating frequency: 1-2-5-10 Hz
9.5 Display function number
9.6 Display function selection lock
9.7 Partial totalizer enable
9.8 Negative totalizer enable
9.9 Net totalizer enable
9.10 Time and date display enable
9.11 Quick start menu visualization

```

DATA LOGGER
D.logger en.= ON
Meas.units= ON
Field separ.= .
Interv.= 01:01:00
Log I+= ON
Log P+= ON
Log I-= ON
Log P-= ON
Log TN= ON
Log PN= ON
Log Q(UM)= ON
Log Q(%)= ON
Log AL.EV= ON
Log STR= ON
Log BTS= ON
Log IBU= ON
Log EDC= ON
Log EAC= ON
Log EIZ= ON
Log SCU= ON
10-Data logger
11-Functions
12-Diagnostic
13-System

```

- 10.1 Permite Data logger
10.2 Measure unit recording enable
10.3 Field separator character
10.4 Sampling interval
10.5 Enable logging of total direct totalizer
10.6 Enable logging of partial direct totalizer
10.7 Enable logging of total reverse totalizer
10.8 Enable logging of partial reverse totalizer
10.9 Enable logging of total net totalizer
10.10 Enable logging of partial net totalizer
10.11 Enable logging of flow rate in measure unit
10.12 Enable logging of flow rate in percentage
10.13 Enable logging of alarm events
10.14 Enable logging of sensor test results
10.15 Enable logging of board temperature
10.16 Enable logging of internal board voltage
10.17 Enable logging of electrodes DC voltage
10.18 Enable logging of electrodes AC voltage
10.19 Enable logging of electrodes impedance
10.20 Enable logging of sensor coils value

```

FUNCTIONS
I+ reset
P+ reset
I- reset
P- reset
Load Sens.f.def
Load Conv.f.def
Save Sens.f.def
Save Conv.f.def
Calibration
11-Functions
12-Diagnostic
13-System

```

- 11.1 Reset total direct
11.2 Reset partial direct
11.3 Reset total revers
11.4 Reset partial reverse
11.5 Setări fabrica - senzor
11.6 Setări fabrica - converter
11.7 Salvare Setări fabrica -
11.8 Save converter factory default values
11.9 Executare calibrare internă

```

DIAGNOSTIC
Self test
Sens.verify
Flow sim.= ON
Display measures
Disp.comm.vars
Display graphs
Gen.sens.set
SD card info
Firmware info
S/N= 999001
WT=0002:21:00:22
12-Diagnostic
13-System

```

- 12.1 Converter auto-test
- 12.2 Sensor verify
- 12.3 Flow rate simulation enabling
- 12.4 Display internal measure value
- 12.5 Display comm. diagnostic values
- 12.6 display measure and graphs
- 12.7 Generic sensor parameters set
- 12.8 Sd card status informations
- 12.9 Firmware version/revision
- 12.10 Board serial number
- 12.11 Total working time

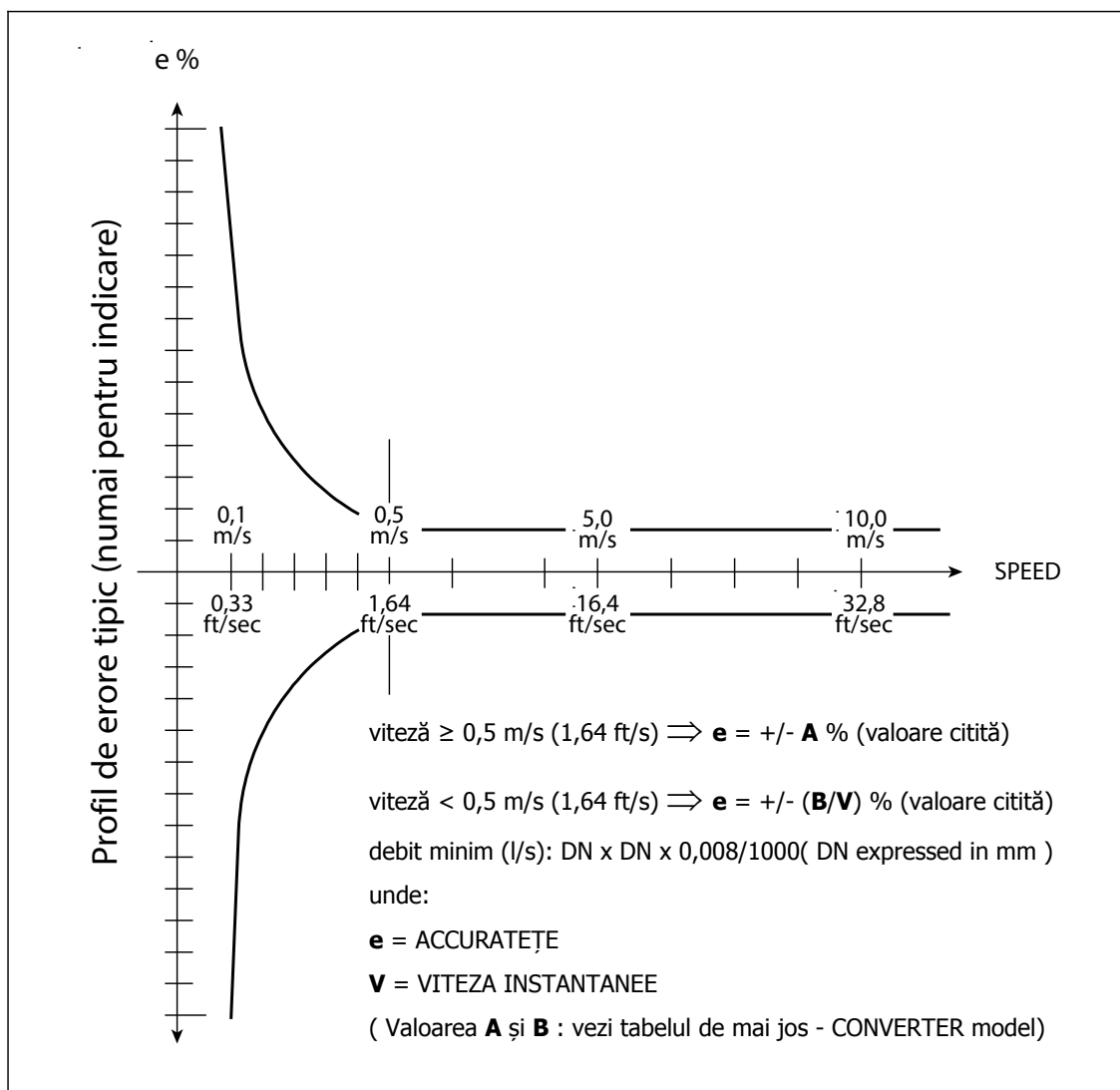
```

SYSTEM
Data saving= ON
Time zone=h+01.00
2016/04/04-16:07
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
Restr.access= ON
010.011.012.013
010.011.012.014
255.255.255.000
KT= 0.96469
KS= 1.00000
KR= 1.00000
DAC1 4mA= 02460
DAC1 20mA= 11050
DAC2 4mA= 02460
DAC2 20mA= 11050
Stand-by
FW update
12-Diagnostic
13-System

```

- 13.1 Salvare zilnică
- 13.2 Localizare zonă de timp
- 13.3 Data și ora
- 13.4 Access level 1 code
- 13.5 Access level 2 code
- 13.6 Access level 3 code
- 13.7 Access level 4 code
- 13.8 Access level 5 code
- 13.9 Access level 6 code
- 13.10 Restricted access level
- 13.11 Adresă IP
- 13.12 Adresă Client IP
- 13.13 Network mask
- 13.14 Calibration coefficient KT
- 13.15 Calibration coefficient KS
- 13.16 Calibration coefficient KR
- 13.17 DAC1 out 4mA calibration point
- 13.18 DAC1 out 20mA calibration point
- 13.19 DAC2 out 4mA calibration point
- 13.20 DAC2 out 20mA calibration point
- 13.21 Stand-by
- 13.22 firmware update

ACCURATEȚE



Senzor cu secțiune completă

MS501/MS1000/MS2410/MS2500			MS 600			MS5000		
A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)
0,8*	0,4**	0,31**	0,8*	0,2**	0,66**	2	1	3,28

* = 0,4 (special)

** = 0,2(m/s) ; 0,66(ft/s) - special

Senzor cu inserție vezi datele senzorului

Condiții utilizate la testare:

- ☐ Debit constant în timpul testului
- ☐ Presiune: >30 Kpa
- ☐ Condiții de scurgere : profil plin
- ☐ Zero stabilitate +/- 0,005 %

CUM COMAND

COD EXAMPLE	Display	
A	A	Blindată (fără display și taste de programare)
	B	Graphic LCD WSTN - B/W - display iluminat, point matrix 128 x 64, 8 line/16 characters and 3 programming keys
Material carcasă / Clasă de protecție		
0	0	Nylon PA6 cu fibră de sticlă, protection rate IP 67
	1	Aluminu vopsit turnat sub presiune, protection rate IP67
	2	Aluminu vopsit turnat sub presiune, protection rate IP68 maxim 1,5 CA , Compact Version, n° 1 IP 68 MIL connector pt.alimentare
	3	Aluminu vopsit turnat sub presiune, protection rate IP68 1,5 meters under water, Compact Version, Complete of n° 1 of 10 poles IP68 MIL connector (outputs connections to be specified) and n° 1 IP 68 MIL connector for power supply
	4	Aluminu vopsit turnat sub presiune, protection rate IP68 1,5 meters under water, Separate Version, Complete of n° 1 IP 68 MIL connectors for cable from the sensor and n° 1 IP 68 MIL connector for power supply
	5	Aluminu vopsit turnat sub presiune, protection rate IP68 1,5 meters under water, Separate Version, Complete of n° 1 IP 68 MIL connectors for cable from the sensor, n° 1 of 10 poles IP68 MIL connector (outputs connections to be specified) and n° 1 IP 68 MIL connector for power supply
Version		
A	A	Compact version cu sensor MS.... (liquid maximum temperature 100 °C)
	B	Separate version pt.motaj pe perete, complete with mounting accessories (CABLE C014)
	C	Compact version cu display vizibil de deasupra
Alimentare		
1	1	Alimentare : 100 ... 240 VAC 44/66 Hz
	2	Alimentare : 24 ... 36 VAC/VDC 0...44/66 Hz
	3	Alimentare : 12...48 VDC
	4	P.S.: 100 ... 240 VAC 44/66 Hz+1 Baterie reincărcabilă(the use of battery supports only the measure; all the outputs are set to OFF)
	5	P.S.: 24 ... 36 VAC/VDC 0...44/66 Hz+1 Baterie reincărcabilă (the use of battery supports only the measure; all the outputs are set to OFF)
	6	P.S. : 12...48 VDC + 1 Baterie reincărcabilă (the use of battery supports only the measure; all the outputs are set to OFF)
Ieșire analogică		
A	A	Fără
	B	n° 1 ieșire 0/4...20/22 mA (Hart optional)
	C	n° 2 ieșiri 0/4...20/22 mA (Hart optional over Out.1)
Intrare / ieșire digitală		
0	0	Numai intrare
	1	With n° 1 ieșire/n°1 intrare
	2	With n° 2 ieșiri/n°1 intrare
Comunicare		
A	A	Fără
	B	RS485 port
	C	Hart (4/20 mA/ Analog OUT n° 1 is required)
	D	Wi-Fi (for programming)
	E	Alte
Protocol		
0	0	Fără
	1	Modbus (RS485)
Precizie		
A	A	Standard 0,8 %
	B	Special 0,4 %
	C	Special (se definește)
Data Logger		

0	0	Fără
	1	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock)
	2	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV (Built In Verificator)
	3	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + Meter Data (Real Time Converter & Sensor Data on SD Memory)
	4	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV + Meter Data
Opțiuni speciale		
A	A	Fără
	B	Cu carcasă anticondens
	C	În° 4 CABLE GLAND 1/2" NPT - IP68 - Nickel plated brass CODE 1.609.1200.70 (CABLE 6 - 12 mm)



MV110-A0A1A0A0A0A (Complete code example for order)

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CERTIFICATE



This is to certify that



WILO SE

Wilopark 1
44263 Dortmund
Germany

with the organizational units/sites as listed in the annex

has implemented and maintains an
Occupational Health and Safety Management System.

Scope:

Development, manufacture, sales and service of pumps and pump systems for Building Services, Water Management and Industry.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 45001 : 2018

Certificate registration no.	060313 OHS18
Date of revision	2022-05-02
Valid from	2020-11-16
Valid until	2023-11-15
Date of certification	2022-05-02



DQS GmbH

Markus Bleher
Managing Director



Annex to certificate
Registration No. 060313 OHS18

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

522450
WILO China Ltd.
Qinhuangdao Branch
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Manufacturing, of Pumps for Building, Industry
and Agriculture

522452
WILO SE Dortmund, Felicitasstraße
Felicitasstraße 5
44263 Dortmund
Germany

Manufacture and service of pumps and pump
systems for Building Services, Water
Management and Industry

514915
WILO Pompa Sistemleri A.Ş.
Orhanlı Mah.
Fettah Başaran Cad. No 91
Tuzla
34956 Istanbul
Turkey

Sales, Service of Pumps & Pump Systems
and Development, Assembly of Pump
Systems for Building Services, Water
Management and Industry

522448
WILO France SAS
ZA Autoroutière 1005 bd de la
Communication
53950 Louverné
France

Logistics, Sales and Customer Services
related to pumps and pump systems for
Building Services, Water Management and
Industry

521116
WILO Pumps Limited
46 Mieumsandan 1-ro
Gangseo-gu
Busan
46730
Republic of Korea

Design, development, manufacture, sales and
service of pumps and pump systems.



Annex to certificate
Registration No. 060313 OHS18

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

521117
WILO ELEC Co., LTD.
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Research, design and production of AC
motors for pumps

521118
WILO Mather and Platt Pumps Private
Limited
S. No. 162,
Mumbai - Pune Road,
Chinchwad
Pune
411 019
India

Design, development and manufacture of
centrifugal pumps/pump sets and valves

521119
WILO Mather and Platt Pumps Private
Limited
E 25, MIDC,
Gokul Shirgaon Industrial Area
Kolhapur
416234
India

Design, development and manufacture of
centrifugal pumps/pump sets and valves

521120
WILO Mather and Platt Pumps Private
Limited
Sales
Sales office,
Ground Floor, Elpro Vision Exchange,
Elpro Compound, CTS No.4270,
Chinchwad
Pune
411 033
India

Design, development and manufacture of
centrifugal pumps/pump sets and valves



Annex to certificate
Registration No. 060313 OHS18

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

520706
WILO France SAS
80 boulevard de l'Industrie
CS 90527
53005 Laval Cedex
France

Development and Manufacture of pumps and pumps systems Logistics, Sales and Customer services related to pumps and pumps systems for Building services, Water management and Industry

520708
WILO China Ltd.
103, Floor 1, Building 1, No. 10 Zhaofeng
2nd Street, Shunyi District
101300 Beijing
China

Design, development, manufacture, sales and after sales service of pumps, pump systems and pump systems piece parts including control box, complete set water supply and drainage equipment, water treatment equipment

283115
WILO SE
Werk Hof
Heimgartenstraße 1-3
95030 Hof
Germany

Development, Manufacture, Sales and Service of:
- Pumps and electrical motors for water supply, lowering of water level and booster plants
- Pumps and electrical motors for sewage disposal and treatment
- Pumps and electrical motors for drainage of pits, sumps, building sites and so on
- Submersible mixers and electrical motors for flow generation or for mixing of liquids for communal or industrial applications
- Technical equipment for sewage and sludge treatment plants, waterworks and pumping stations



CERTIFICATE



This is to certify that



WILO SE

Wilopark 1
44263 Dortmund
Germany

with the organizational units/sites as listed in the annex

has implemented and maintains an **Energy Management System**.

Scope:

Development, manufacture, sales and service of pumps and pump systems for Building Services, Water Management and Industry.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 50001 : 2018

Certificate registration no.	060313 EMSt18
Valid from	2022-05-02
Valid until	2025-04-14
Date of certification	2022-05-02



DQS GmbH

Markus Bleher
Managing Director



Annex to certificate
Registration No. 060313 EMSt18

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

522452
WILO SE Dortmund, Felicitasstraße
Felicitasstraße 5
44263 Dortmund
Germany

Manufacture and service of pumps and pump systems for Building Services, Water Management and Industry.

283115
WILO SE
Werk Hof
Heimgartenstraße 1-3
95030 Hof
Germany

Development, Manufacture, Sales and Service of:
- Pumps and electrical motors for water supply, lowering of water level and booster plants
- Pumps and electrical motors for sewage disposal and treatment
- Pumps and electrical motors for drainage of pits, sumps, building sites and so on
- Submersible mixers and electrical motors for flow generation or for mixing of liquids for communal or industrial applications
- Technical equipment for sewage and sludge treatment plants, waterworks and pumping stations

546220
WILO SE Dortmund, Breisenbachstraße
Werk Oestrich
Breisenbachstraße 100
44357 Dortmund
Germany

Manufacture and service of pumps and pump systems for Building Services, Water Management and Industry



CERTIFICATE



This is to certify that



WILO SE

Wilopark 1
44263 Dortmund
Germany

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System**.

Scope:

Development, manufacture, sales and service of pumps and pump systems for Building Services, Water Management and Industry.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2015

Certificate registration no.	060313 QM15
Valid from	2021-04-30
Valid until	2024-04-29
Date of certification	2021-04-17



DQS GmbH

Markus Bleher
Managing Director



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

31601951
Wilo Middle East Fze
Plot No. S30120A
Jebel Ali Free zone-South
PO Box 262720 Dubai
United Arab Emirates

Pumps Assembling and Pumps, Engines,
Valves and Spare parts Trading

501447
WILO Pumpen Österreich GmbH
WILO Straße 1
2351 Wiener Neudorf
Austria

Sales and service of pumps and pump
systems for Building Services, Water
Management and Industry.

516442
WILO nv
Rusatiralaan 2
1083 Ganshoren
Belgium

Sales and service of pumps and pump
systems for Building Services, Water
Management and Industry.

522450
WILO China Ltd.
Qinhuangdao Branch
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Manufacturing, of Pumps for Building, Industry
and Agriculture.

521117
WILO ELEC Co., LTD.
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Design, development and manufacture of AC
motors for pumps



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

520708
WILO China Ltd.
103, Floor 1, Building 1, No. 10 Zhaofeng
2nd Street, Shunyi District
101300 Beijing
China

Design, development, manufacture, sales and after sales service of pumps, pump systems and pump systems piece parts including control box. Design, development, manufacture, sales and after sales service of complete set water supply and drainage equipment.

545714
WILO IndustrieSysteme GmbH
Chemnitzer Str. 81
09224 Chemnitz
Germany

Development, manufacture, sales and service of pump systems and filter systems for Building Services, Water Management and Industry.

070047
WILO SE
Anderslebener Straße 161
39387 Oschersleben
Germany

Development and manufacture of pumps and pump systems for Building Services, Water Management and Industry.

522452
WILO SE Dortmund, Felicitasstraße
Felicitasstraße 5
44263 Dortmund
Germany

Manufacture and service of pumps and pump systems for Building Services, Water Management and Industry.



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

283115
WILO SE
Heimgartenstraße 1-3
95030 Hof
Germany

Scope

Development, Manufacture, Sales and Service of:
- Pumps and electrical motors for water supply, lowering of water level and booster plants
- Pumps and electrical motors for sewage disposal and treatment
- Pumps and electrical motors for drainage of pits, sumps, building sites and so on
- Submersible mixers and electrical motors for flow generation or for mixing of liquids for communal or industrial applications
- Technical equipment for sewage and sludge treatment plants, waterworks and pumping stations

521114
WILO INTEC S.A.S.
50, avenue Eugene Casella
18700 Aubigny-sur-Nère
France

Design, manufacturing and sales of circulators and hydraulic units for Heating Ventilation Air Conditioning industry.

520706
WILO France SAS
80 boulevard de l'Industrie
CS 90527
53005 Laval Cedex
France

Development and Manufacture of pumps and pumps systems Logistics, Sales and Customer services related to pumps and pumps systems for Building services, Water management and Industry.

522448
WILO France SAS
ZA Autoroutière 1005 bd de la
Communication
53950 Louverné
France

Logistics, Sales and Customer Services related to pumps and pump systems for Building Services, Water Management and Industry.



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

520707
WILO France SAS
53, boulevard de la République Espace
Lumière, Bât. 6
78400 Chatou
France

Sales and Customer Services related to pumps and pump systems for Building Services, Water Management and Industry.

525082
WILO Magyarország Kft.
Torbágy u. 14
2045 Törökbálint
Hungary

Sales and service of pumps and pump systems for Building Services, Water Management and Industry.

521118
WILO Mather and Platt Pumps Private
Limited
S. No. 162,
Mumbai - Pune Road,
Chinchwad
Pune 411 019
India

Design, development, manufacture, installation and servicing of centrifugal pumps/pump sets and valves and contracts of pumping system on turnkey basis.

521120
WILO Mather and Platt Pumps Private
Limited
Sales office,
Ground Floor, Elpro Vision Exchange,
Elpro Compound, CTS No.4270,
Chinchwad
Pune 411 033
India

Design, development, manufacture, installation and servicing of centrifugal pumps/pump sets and valves and contracts of pumping system on turnkey basis.

521119
WILO Mather and Platt Pumps Private
Limited
E 25, MIDC,
Gokul Shirgaon Industrial Area
Kolhapur 416234
India

Design, development, manufacture, installation and servicing of centrifugal pumps/pump sets and valves and contracts of pumping system on turnkey basis.



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

521113
STEMMA S.R.L.
via postale VECCHIA, 20
36070 Trissino.VI
Italy

Manufacture of stainless steel components for pumps and Technical products.

521116
WILO Pumps Limited
46 Mieumsandan 1-ro
Gangseo-gu
Busan 46730
Republic of Korea

Design, development, manufacture, sales and service of pumps and pump systems.

522451
Wilo Polska Sp. z o.o.
Jedności 5
05-506 Lesznów
Poland

Designing, manufacturing, selling, servicing pump sets, pump stations and pump accessories for heating, ventilation, air conditioning, water supply, sanitary engineering and fire protection services.

531788
WILO RUS LLC
Industrial site No.1, house 1
Novoe Podvyaznovo village
Noginsk township
Noginsk district
Russische Föderation
142434
Russian Federation

Development, manufacture, sales and service of pumps and pump systems for Building Services, Water Management and Industry.

527816
WILO INTEC SAS, Organizacna zlozka
Slovakia
Trenčianske Stankovce 3083
91311
Slovakia

Manufacturing of circulators for Heating Ventilation Air Conditioning industry.



Annex to certificate
Registration No. 060313 QM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

518368
WILO Nordic AB
Isbjörnsvägen 6
35245 Växjö
Sweden

Sales and service of pumps and pump systems for Building Services, Water Management and Industry.

514915
WILO Pompa Sistemleri A.Ş.
Orhanlı Mah.
Fettah Başaran Cad. No 91
Tuzla
34956 İstanbul
Turkey

Sales, Service of Pumps & Pump Systems and Development, Assembly of Pump Systems for Building Services, Water Management and Industry.



CERTIFICATE



This is to certify that



WILO SE

Wilopark 1
44263 Dortmund
Germany

with the organizational units/sites as listed in the annex

has implemented and maintains an **Environmental Management System**.

Scope:

Development, manufacture, sales and service of pumps and pump systems for Building Services, Water Management and Industry.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 14001 : 2015

Certificate registration no.	060313 UM15
Valid from	2021-04-30
Valid until	2024-04-29
Date of certification	2021-04-17



DQS GmbH

Markus Bleher
Managing Director



Annex to certificate
Registration No. 060313 UM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

522450
WILO China Ltd.
Qinhuangdao Branch
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Manufacturing, of Pumps for Building, Industry and Agriculture.

521117
WILO ELEC Co., LTD.
No.285 Qinhuang West Street,
Qinhuangdao Economic & Technological
Development Zone
066004 Qinhuangdao, Hebei Province
China

Design, development and manufacture of AC motors for pumps.

520708
WILO China Ltd.
103, Floor 1, Building 1, No. 10 Zhaofeng
2nd Street, Shunyi District
101300 Beijing
China

Design, development, manufacture, sales and after sales service of pumps, pump systems and pump systems piece parts including control box. Design, development, manufacture, sales and after sales service of complete set water supply and drainage equipment.

070047
WILO SE
Anderslebener Straße 161
39387 Oschersleben
Germany

Development and manufacture of pumps and pump systems for Building Services, Water Management and Industry.

522452
WILO SE Dortmund, Felicitasstraße
Felicitasstraße 5
44263 Dortmund
Germany

Manufacture and service of pumps and pump systems for Building Services, Water Management and Industry.



Annex to certificate
Registration No. 060313 UM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

283115
WILO SE
Heimgartenstraße 1-3
95030 Hof
Germany

Scope

Development, Manufacture, Sales and Service of:
- Pumps and electrical motors for water supply, lowering of water level and booster plants
- Pumps and electrical motors for sewage disposal and treatment
- Pumps and electrical motors for drainage of pits, sumps, building sites and so on
- Submersible mixers and electrical motors for flow generation or for mixing of liquids for communal or industrial applications
- Technical equipment for sewage and sludge treatment plants, waterworks and pumping stations

521114
WILO INTEC S.A.S.
50, avenue Eugene Casella
18700 Aubigny-sur-Nère
France

Design, manufacturing and sales of circulators and hydraulic units for Heating Ventilation Air Conditioning industry.

520706
WILO France SAS
80 boulevard de l'Industrie
CS 90527
53005 Laval Cedex
France

Development and Manufacture of pumps and pumps systems Logistics, Sales and Customer services related to pumps and pumps systems for Building services, Water management and Industry.

522448
WILO France SAS
ZA Autoroutière 1005 bd de la
Communication
53950 Louverné
France

Logistics, Sales and Customer Services related to pumps and pump systems for Building Services, Water Management and Industry.



Annex to certificate
Registration No. 060313 UM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

Scope

520707
WILO France SAS
53, boulevard de la République Espace
Lumière, Bât. 6
78400 Chatou
France

Sales and Customer Services related to pumps and pump systems for Building Services, Water Management and Industry.

521118
WILO Mather and Platt Pumps Private
Limited
S. No. 162,
Mumbai - Pune Road,
Chinchwad
Pune 411 019
India

Design, development and manufacture of centrifugal pumps/pump sets and valves.

521120
WILO Mather and Platt Pumps Private
Limited
Sales office,
Ground Floor, Elpro Vision Exchange,
Elpro Compound, CTS No.4270,
Chinchwad
Pune 411 033
India

Design, development and manufacture of centrifugal pumps/pump sets and valves.

521119
WILO Mather and Platt Pumps Private
Limited
E 25, MIDC,
Gokul Shirgaon Industrial Area
Kolhapur 416234
India

Design, development and manufacture of centrifugal pumps/pump sets and valves.

521116
WILO Pumps Limited
46 Mieumsandan 1-ro
Gangseo-gu
Busan 46730
Republic of Korea

Design, development, manufacture, sales and service of pumps and pump systems.





Annex to certificate
Registration No. 060313 UM15

WILO SE

Wilopark 1
44263 Dortmund
Germany

Location

514915
WILO Pompa Sistemleri A.Ş.
Orhanlı Mah.
Fettah Başaran Cad. No 91
Tuzla
34956 Istanbul
Turkey

Scope

Sales, Service of Pumps & Pump Systems
and Development, Assembly of Pump
Systems for Building Services, Water
Management and Industry.