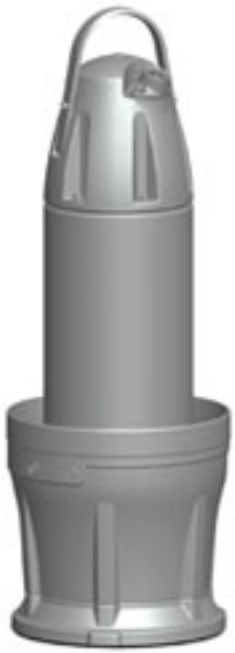
LENNTECH
WATER TREATMENT SOLUTIONS

Technical Specification



P7020, P7030, P7035, P7040

Large Submersible Pumps

LENNTECH
info@lenntech.com Tel. +31-152-610-900
www.lenntech.com Fax. +31-152-616-289

FLYGT
a xylem brand

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1 Product Description

1.1 Product overview

Submersible propeller pumps for clean, surface, or storm water. Intended for transport of large volumes of water at low heads, in column installation, in the most cost effective way. The pump is designed with a considerably smaller footprint than conventional pumps. An N-version propeller design is available for pumping screened wastewater, with sustained high efficiency.

Installation

L-installation

Accessories

Mechanical accessories which are available include the following:

- Cable handling system
- Lifting equipment

Electrical accessories which are available include the following:

- Pump controller
- Control panels
- Starters
- MiniCAS-II monitoring

See your Xylem representative for further information.

Options

The following options are available:

- Zinc anodes for corrosion protection in sea water
- Special coating system (with epoxy base coat) for demanding environments

1.2 Materials

Propeller

Material	Internal material number	Standard	
		Europe	USA
Stainless steel (austenitic)	M0344.2343.12	EN 10283 Nos. 1.4408, 1.4412	ASTM A 743 CF-8M

Major castings

Item	Available materials	Internal material number	Standard	
			Europe	USA
Pump housing	Cast iron	M0314.0125.00	EN 1561 No. JL 1040	ASTM-A 48 – No. 35 B
Bellmouth	Hard-Iron™ High chromium cast iron	M0344.0466	EN 12513 No. 5.5610	ASTM-A 532 – Alloy III A
Other major castings	Cast iron	M0314.0125.00	EN 1561 No. JL 1040	ASTM-A 48 – No. 35 B

Lifting handle

Material	Internal material number	Standard	
		Europe	USA
Stainless steel (austenitic)	M0344.2343.02	EN 10088-2 Nos. 1.4404, 1.4432, 1.4435, 1.4436 and 1.4571	ASTM/AISI 316L and 316Ti

Mechanical face seals

Seal	Material, rotating ring	Material, stationary ring
Inner	Wolfram Carbide Corrosion Resistant (WCCR)	WCCR
Outer	WCCR	WCCR
	Silicon carbide (RSIC)	RSIC

Motor shaft

Available materials	Internal material number	Standard	
		Europe	USA
Stainless steel (martensitic)	M0344.2321.03	EN 10088-3 No. 1.4057	ASTM/AISI 431

Fasteners

Available materials	Internal material number	Standard	
		Europe	USA
Stainless steel (austenitic)	M0344.2340	EN 10088 No. 1.4401, 1.4404, 1.4406, 1.4432, 1.4436 and 1.4571	ASTM/AISI-316, 316Ti and 316L

O-rings

Available materials	Internal material number	Standard	
		Europe	USA
Nitrile rubber (NBR) 70º IRH	M0516.2637.04	–	–
Fluorinated rubber (FPM)	M0516.2677.32	–	–

Coating system

The following table describes the two variants of paint systems available for the pump, Standard and Special. The choice of coating system depends upon the service environment.

Coating system	Basecoat	Topcoat	Total dry film thickness
Standard	Acrylic (waterborne) or alkyd (solventborne)	Oxirane ester, 2–pack	120–350 µm
Special (option)	Epoxy, 2 layers	Oxirane ester, 2–pack, 1 layer	350–700 µm

Other coating systems are available for special requirements such as drinking water, high temperature or erosion applications. See the Xylem internal standard M0700.00.0001 (Coating Selection Guidelines).

1.3 Mounting-related data

Depth of immersion

The maximum depth of immersion is 20 m (65 ft).

Weight

Table 1: Weights, without cables

Pump	Weight, kg (lb)
P7020	250 (551)
P7030	450 (992)
P7035	800 (1764)
P7040	800 (1764)

Cables

SUBCAB®	Maximum voltage 600–1000 V, intended for drive units up to 1.1 kV. To be dimensioned by Xylem.

Engineering data

Performance curves, motor data and dimensional drawings are available from your Xylem representative.

Pump (ball-) throughlet

Pump	Throughlet	
	mm	in.
P7020	46	1.81
P7030	64	2.52
P7035	50	1.97
P7040	79	3.11

2 Operational Data

2.1 Application limits

Table 2: Process data

Parameter	Value
Liquid temperature	Max. +40°C (+105°F)
Depth of immersion	Max. 20 m (65 ft.)
pH of pumped liquid	pH 5.5–14
Liquid density	Max. 1100 kg/m^3 (9.17 lb per gal.)

2.2 Motor data

Motor characteristics

Insulation class	H (+180°C, +356°F)
Voltage variation	Maximum +/- 10%
Voltage imbalance between phases	Maximum 2%
Number of starts per hour	Maximum 30

Frequency

Pump	50 Hz	60 Hz
7020.090, 7020.180	X	X
7030.090, 7030.180	X	X
7035.090, 7035.180	X	X
7040.090, 7040.180	X	X

2.3 Monitoring systems

The pump is designed to be used with the following monitoring systems:

- MAS 801
- MAS 711: P7030, P7035, and P7040 only
- MiniCAS II

2.4 Monitoring with MAS 801

Pumps with the standard MAS 801 equipment are mounted with the following items:

- Thermal contacts or PTC thermistors for stator winding temperature monitoring (3 in series)
- Leakage sensor in the leakage chamber
- Leakage sensor in the junction box
- Pt100 sensor for main bearing temperature monitoring
- Pt100 sensor for stator winding temperature in one phase
- Vibration in three directions
- Current transformer for pump current and frequency measurement

The following options are possible with MAS 801:

- Pt100 sensors for stator winding temperature measurement in phases 2 and 3
- Pt100 sensor for support bearing temperature measurement

Optional monitoring channels by using power analyzer PAN 312

- Three-phase power
- Power factor
- System voltage
- Voltage imbalance
- Pump current
- Current imbalance

2.4.1 System overview

The MAS 801 is a monitoring system that protects the pumps, by using measurements from pump sensors and measurement modules. The system offers considerable functionality for the benefit of different user categories:

- A graphical user interface, the configuration and analysis tool, for computer and HMI
- Local and remote presentation of pump status, key data, and alarms
- Analysis and troubleshooting that is based on graph functions, alarm lists, and black boxes
- Service reminders and reporting
- Configuration of the system and monitoring channels
- Protocols for communication with external automation electronics, SCADA, and cloud applications

The system consists of a central unit a base unit, a pump electronic module, and an HMI.

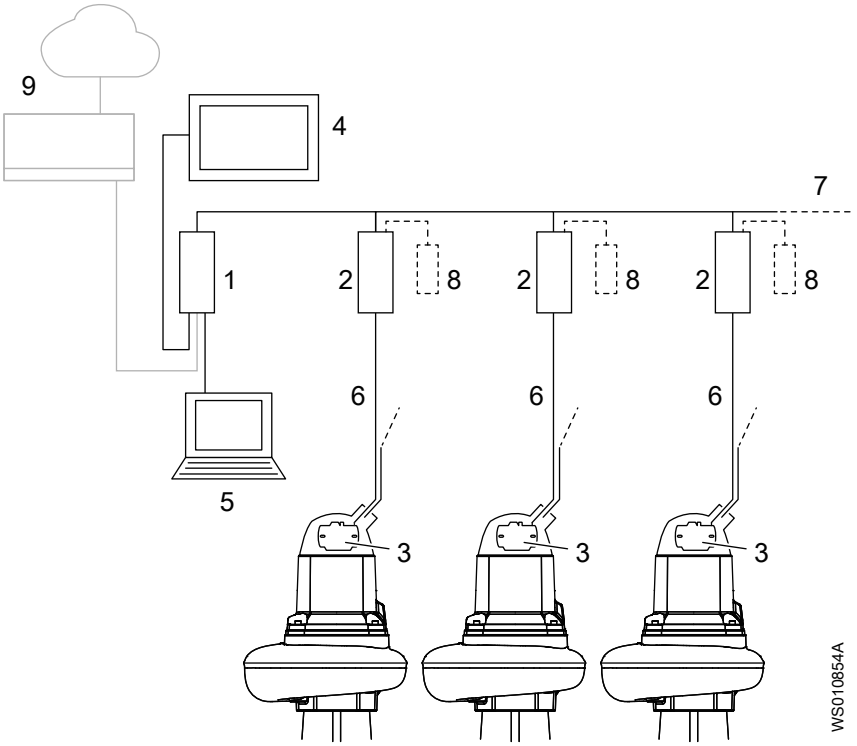

Table 3: Parts

Number	Part	Product name	Description
1	Central unit (CU)	MAS CU 801	The central unit communicates with all base units in the system, up the maximum ten base units. The central unit includes the configuration and analysis tool, embedded webpages, that is used to interact in the system. The central unit is typically installed in an electrical cabinet.

Number	Part	Product name	Description
2	Base unit (BU)	MAS BU 811	The base unit communicates data between the pump electronic module and the central unit. If needed, for pump protection, the base unit stops the pump. The base unit is typically installed in an electrical cabinet.
3	Pump electronic module (PEM)	MAS PEM 811	The pump electronic module communicates with the base unit and contains factory settings, specific to the individual pump. It is connected to the pump sensors and stores measured data. The pump electronic module is mounted in the pump junction box.
4	Human-machine interface (HMI)	FOP 402	The HMI is connected to the central unit and displays the configuration and analysis tool, for user interaction. The HMI is typically front-mounted in an electrical cabinet door.
5	Computer	-	A computer can be connected to the central unit locally or remotely, and displays the configuration and analysis tool, for user interaction.
6	Two-wire communication	-	Bus communication between the pump electronic module and the base unit in a SUBCAB® cable. The bus communication is tolerant to electromagnetic interference.
7	DeviceNet	-	Communication bus connecting the central unit with base units.
8	Power analyzer, optional	PAN 312	Measures power, power factor, current in three phases, voltage in three phases, voltage imbalance, energy
9	Controller SCADA system	-	Not part of the MAS 801 system. MAS 801 uses open protocol for communication with external controller or SCADA systems.

Communication

Measurements and pump information are transmitted over the two wires from each pump electronic module. The data goes through the base unit and further on to the central unit over the DeviceNet bus. This way two equal databases (CU and PEM) of pump information are continually updated securing redundancy and providing different access possibilities.

2.4.2 Stator temperature monitoring methods

The purpose of stator-winding temperature monitoring is to make the motor shut off at high temperature. There are two monitoring methods, depending on the types of thermal sensors chosen.

Table 4: Stator temperature monitoring configuration

Configuration with thermal switches	Configuration with thermistors
• Three thermal switches, connected in series, are incorporated in the coil ends of the stator winding. The switches are normally closed, and open at 140°C (285°F). • One Pt100 sensor is incorporated in one of the windings.	• Three thermistors, PTC, connected in series, are incorporated in the coil ends of the stator windings. T_{Ref}=140°C (285°F). • One Pt100 sensor is incorporated in one of the windings.

By using an analogue sensor, two adjustable alarm limits can be used, one for warning ("B"-alarm) and one for pump stop ("A"-alarm).

2.5 Monitoring with MAS 711

The MAS 711 monitoring equipment can be used with pump models P7030, P7035, and P7040, in applications with only one (1) motor cable. The motor cable must be screened.

Pumps with the standard MAS 711 equipment use a 12-lead auxiliary cable, plus 4 leads from the motor cable, for the following:

- Thermal switches for stator temperature monitoring (three in series) or PTC thermistors
- Leakage sensor in the inspection chamber
- Leakage sensor in the junction box
- Analogue temperature sensor (Pt100) for main bearing temperature monitoring
- Analogue temperature sensor (Pt100) for stator winding temperature in one phase
- Vibration sensor VIS 10
- Analogue temperature sensor (Pt100) for support bearing temperature monitoring
- Pump memory

2.5.1 Stator temperature monitoring methods

The purpose of stator-winding temperature monitoring is to make the motor shut off at high temperature. There are two monitoring methods, depending on the types of thermal sensors chosen.

Table 5: Stator temperature monitoring configuration

Configuration with thermal switches	Configuration with thermistors
• Three thermal switches, connected in series, are incorporated in the coil ends of the stator winding. The switches are normally closed, and open at 140°C (285°F). • One Pt100 sensor is incorporated in one of the windings.	• Three thermistors, PTC, connected in series, are incorporated in the coil ends of the stator windings. T_{Ref}=140°C (285°F). • One Pt100 sensor is incorporated in one of the windings.

By using an analogue sensor, two adjustable alarm limits can be used, one for warning ("B"-alarm) and one for pump stop ("A"-alarm).

2.6 Monitoring with MiniCAS II

This table shows the parameters which can be tracked with the MiniCAS II monitoring system.

Parameter	Sensor	Standard or optional
Stator winding temperature	One of the following choices: • Standard: 3 thermal switches • Optional: 3 PTC thermistors	Standard
Leakage in the inspection chamber	Float switch leakage sensor (FLS)	Standard
Leakage in the junction box	Float switch leakage sensor (FLS)	Optional

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

LENNTECH
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www.lenntech.com Fax. +31-152-616-289

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The original instruction is in English. All non-English instructions are translations of the original instruction.