

# DP, EF, SL1, SLV, standard and AUTO<sub>ADAPT</sub> pumps

0.6 to 2.6 kW

50 Hz



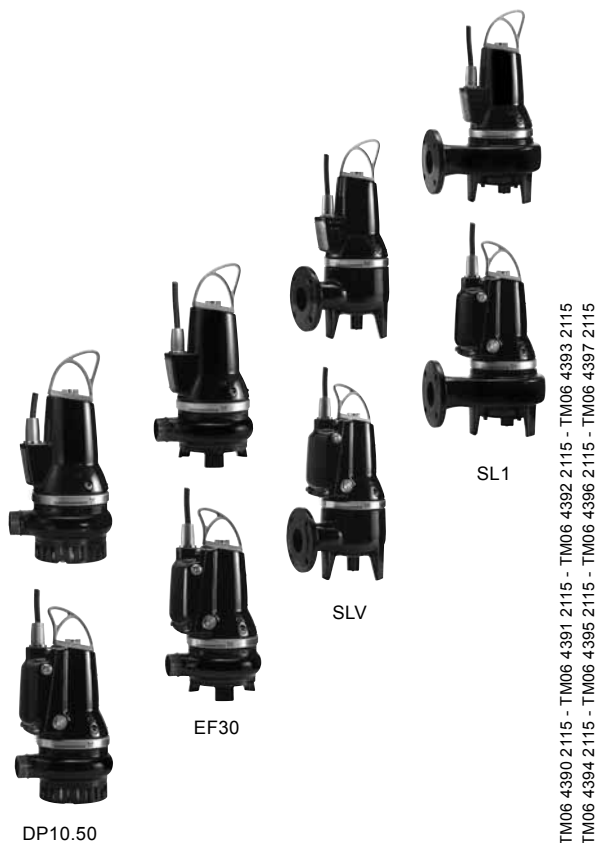
<b>1. Introduction</b>	<b>4</b>
Introduction	4
Applications	4
Construction features	5
<b>2. Identification</b>	<b>6</b>
Type keys	6
Nameplate	7
<b>3. Selection of product</b>	<b>8</b>
Ordering a pump	8
Explosion-proof version	8
Selection of AUTO <sub>ADAPT</sub> applications	9
<b>4. Performance range</b>	<b>10</b>
Performance overview	10
<b>5. Product range</b>	<b>11</b>
Standard pumps	11
Explosion-proof pumps	14
<b>6. Variants</b>	<b>18</b>
List of variants	18
<b>7. Construction</b>	<b>19</b>
Material specification, DP and EF, standard pumps	19
Material specification, DP 10 and EF, AUTO <sub>ADAPT</sub> pumps	26
Material specification, SL1 and SLV, standard pumps	33
Material specification, SL1 and SLV, AUTO <sub>ADAPT</sub> pumps	38
<b>8. Product description</b>	<b>43</b>
Features	43
Operating conditions	44
Pumped liquids	44
Motor range	44
Frequency converter operation	44
Approvals	45
Wiring diagrams	46
<b>9. Curve charts</b>	<b>47</b>
Curve conditions	48
Performance tests	48
Certificates	48
Witness test	48
<b>10. Performance curves and technical data</b>	<b>49</b>
DP 10.50.09.(A)/(E).(Ex).2.1.502	49
DP 10.50.09.(A)/(E).(Ex).2.50B	50
DP 10.50.15.(A)/(E).(Ex).2.50B	51
DP 10.65.26.(A)/(E).(Ex).2.50B	52
EF 30.50.06.(A)/(E).(Ex).2.1.502	53
EF 30.50.06.(A)/(E).(Ex).2.50B	54
EF 30.50.09.(A)/(E).(Ex).2.1.502	55
EF 30.50.09.(A)/(E).(Ex).2.50B	56
EF 30.50.11.(A)/(E).(Ex).2.1.502	57
EF 30.50.11.(A)/(E).(Ex).2.50B	58
EF 30.50.15.(A)/(E).(Ex).2.50B	59
SL1.50.65.09.(A)/(E).(Ex).2.1.502	60
SL1.50.65.09.(A)/(E).(Ex).2.50B/C	61
SL1.50.65.11.(A)/(E).(Ex).2.1.502	62
SL1.50.65.11.(A)/(E).(Ex).2.50B/C	63
SL1.50.65.15.(A)/(E).(Ex).2.50B/C	64
SLV.65.65.09.(A)/(E).(Ex).2.1.502	65
SLV.65.65.09.(A)/(E).(Ex).2.50B	66
SLV.65.65.11.(A)/(E).(Ex).2.1.502	67

SLV.65.65.11.(A)/(E).(Ex).2.50B .....	68
SLV.65.65.15.(A)/(E).(Ex).2.50B .....	69
<b>11. Dimensions</b> .....	<b>70</b>
DP and EF .....	70
SL1 and SLV .....	74
<b>12. Accessories</b> .....	<b>77</b>
<b>13. Grundfos Product Center</b> .....	<b>84</b>

# 1. Introduction

## Introduction

This data booklet deals with small Grundfos DP, EF, SL1 and SLV wastewater pumps, both standard pumps and AUTO<sub>ADAPT</sub> pumps.



**Fig. 1** DP, EF, SL1, SLV standard and AUTO<sub>ADAPT</sub> pumps

The pumps are SuperVortex (free-flow) and single-channel impeller pumps specifically designed for pumping sewage and wastewater in a wide range of municipal, private and industrial applications.

The pumps are made of wear-resistant materials, such as cast iron and stainless steel. These materials ensure reliable operation.

The pumps are available with motors of 0.6 kW and up to and including 2.6 kW.

The nominal diameter of the pump outlet port is 50 mm (Rs2) or DN 65 for DP.10.65.26.

The pumps are available for

- submerged installation on auto-coupling system
- submerged installation, free-standing.

## Applications

Typical applications are transfer of liquids, such as:

- municipal wastewater
- wastewater with high content of fibres (SuperVortex impeller)
- drainage water and groundwater
- domestic wastewater
- industrial wastewater
- process and cooling water.

The pumps are ideal for the pumping of the above liquids from for instance:

- municipal network pumping stations
- public buildings
- blocks of flats
- factories/industry.

## Construction features

All pumps have the following features:

- cable connection to motor by stainless steel cable plug
- watertight cable entry of corrosion-resistant barrier of polyamide cast inside the cable plug housing
- power supply cable incorporating wires for thermal sensors in the motor windings
- no additional cable required for sensors in pumps with sensors
- monitoring of operating conditions for pumps with sensors
- moisture detector for continuous monitoring of motor enclosure and automatic cut-out in case of leakage
- heavy-duty bearings greased for life
- built for frequency converter operation
- smooth pump surface preventing dirt and impurities from sticking to the pump
- self-cleaning channel impeller with long vanes reducing the risk of jamming or clogging, or Super-Vortex impeller with high pumping efficiency and less downtime
- explosion-proof motors for potentially explosive environments
- Motor insulation class F (155 °C).
- enclosure class IP68 with thermal sensor in each phase

Service-friendly design:

- clamp connection between motor and pump
- cartridge shaft seal.

### Additional DP, EF, SL1, SLV AUTO<sub>ADAPT</sub> features

The AUTO<sub>ADAPT</sub> pumps incorporate control functions, level sensors and electro-mechanical motor protection that are traditionally separated from the pump. This allows the AUTO<sub>ADAPT</sub> pumps to operate entirely on their own, even if there are several AUTO<sub>ADAPT</sub> pumps in the same pit. They only need to be connected to the mains supply.

The AUTO<sub>ADAPT</sub> pumps offer the following benefits:

- built-in level and dry-running sensors
- built-in motor protection
- pump alternation.

If several AUTO<sub>ADAPT</sub> pumps are installed in the same pit, the control logic incorporated in the pump will ensure that the load is distributed evenly among the pumps over time.

- alarm relay output.  
The pump incorporates an alarm relay output. NC and NO are available and can be used as required, for example for acoustic or visual alarms.

Alarm	Alarm log	Signal relay
Overvoltage	•	•
Undervoltage	•	•
Overload	•	•
Blocked motor/pump	•	•
Dry running	•	
Motor temperature	•	•
Electronics temperature (Pt1000)	•	•
Thermal switch 1 in motor	•	•
Thermal switch 2 in motor	•	•
Phase sequence reversed	•	•
High-level alarm	•	•
Sensor fault	•	•

- the pump does not start unless the phase sequence is correct
- self-calibration after each pump cycle
- anti-seizing function.  
The anti-seizing function will start the pump at programmed intervals to prevent the impeller from seizing up. This function will override the dry-running sensor of non-Ex versions.
- random start delay.  
This function ensures an even mains load when several pumps are started at the same time after an unintentional power cut.
- automatic phase sequence detection (three-phase)
- starting torque boost for additional starting torque (single-phase)
- after-run function (foam draining).  
The after-run function can be used at programmed intervals if there is a risk of a floating layer.

The Grundfos Communication Interface Unit (CIU) enables data communication via open and interoperable networks such as Profibus, DP, Modbus RTU, LONWorks, BACnet MS/TP®, PROFINET IO, Modbus TCP, GSM/GPRS (wireless), or using Grundfos Remote Management (GRM). CIU can be permanently or temporarily connected for changing the default settings, making further settings or reading the alarm log and operating parameters, such as number of starts and operating hours.

## 2. Identification

### Type keys

The type keys cover the entire ranges of Grundfos DP, EF, SL1, SLV standard and AUTO<sub>ADAPT</sub> wastewater pumps. Each pump can be identified by means of the type key.

#### DP and EF, standard

Example **DP10.50.09.Ex.2.1.502**

Code	Explanation	Designation
DP	Grundfos drainage pump	Pump type
EF	Grundfos effluent pump	
10	Maximum spherical impeller clearance [mm]	Impeller clearance
50	Nominal diameter of outlet port [mm]	Pump outlet
09	Code number from type designation / 10 [kW]	Outlet power
[ ]	Standard	
A	Connected to a CU 100 control box	Sensor version
[ ]	Standard pump	
Ex	Explosion-proof pump	Pump version
2	2-pole	Number of poles
1	Single-phase motor	Number of phases
[ ]	Three-phase motor	
5	50 Hz	Frequency
02	230 V, direct-on-line starting	Supply voltage and starting method
0B	400-415 V, direct-on-line starting	
0C	230-240 V, direct-on-line starting	
Z	Custom-built pump	Customisation

#### DP and EF, AUTO<sub>ADAPT</sub>

Example **DP10.50.15.E.Ex.2.1.502**

Code	Explanation	Designation
DP	Grundfos drainage pump	Pump type
EF	Grundfos effluent pump	
10	Maximum spherical impeller clearance [mm]	Impeller clearance
50	Nominal diameter of outlet port [mm]	Pump outlet
15	Code number from type designation / 10 [kW]	Outlet power
[ ]	Standard	
E	Electronic version with AUTO <sub>ADAPT</sub> functions	Sensor version
[ ]	Standard pump	
Ex	Explosion-proof pump	Pump version
2	2-pole	Number of poles
1	Single-phase motor	Number of phases
[ ]	Three-phase motor	
5	50 Hz	Frequency
02	230 V, direct-on-line starting	Supply voltage and starting method
0B	400-415 V, direct-on-line starting	
0C	230-240 V, direct-on-line starting	
Z	Custom-built pump	Customisation

#### SL1 and SLV, standard

Example **SLV.65.65.15.Ex.2.50B**

Code	Explanation	Designation
SL	Grundfos sewage and wastewater pump	Pump type
1	Single-channel impeller	Impeller type
V	SuperVortex (free-flow) impeller	
80	Maximum solid size [mm]	Pump passage
80	Nominal diameter of outlet port [mm]	Pump outlet
40	Code number from type designation / 10 [kW]	Outlet power
[ ]	Standard	
A	Connected to a CU 100 control box	Sensor version
[ ]	Standard pump	
Ex	Explosion-proof pump	Pump version
2	2-pole	Number of poles
1	Single-phase motor	Number of phases
[ ]	Three-phase motor	
5	50 Hz	Frequency
02	230 V, direct-on-line starting	Supply voltage and starting method
0B	400-415 V, direct-on-line starting	
0C	230-240 V, direct-on-line starting	
Z	Custom-built pump	Customisation

**Note:** The pump types are not available in all variants.

#### SL1 and SLV, AUTO<sub>ADAPT</sub>

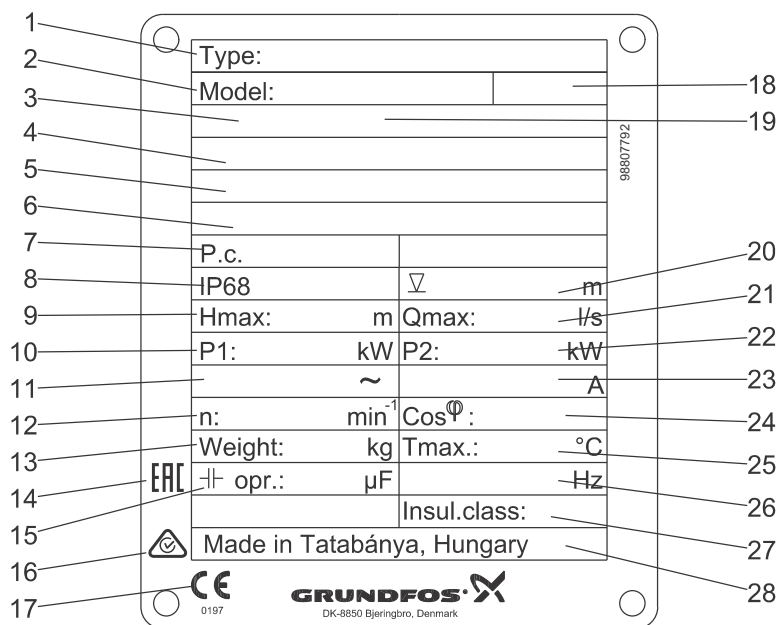
Example **SL1.50.65.11.E.Ex.2.1.502**

Code	Explanation	Designation
SL	Grundfos sewage and wastewater pump	Pump type
1	Single-channel impeller	Impeller type
V	SuperVortex (free-flow) impeller	
50	Maximum spherical impeller clearance [mm]	Impeller clearance
65	Nominal diameter of outlet port [mm]	Pump outlet
11	Code number from type designation / 10 [kW]	Outlet power
[ ]	Standard	
E	Electronic version with AUTO <sub>ADAPT</sub> functions	Sensor version
[ ]	Standard pump	
Ex	Explosion-proof pump	Pump version
2	2-pole	Number of poles
1	Single-phase motor	Number of phases
[ ]	Three-phase motor	
5	50 Hz	Frequency
02	230 V, direct-on-line starting	Supply voltage and starting method
0B	400-415 V, direct-on-line starting	
Z	Custom-built pump	

**Note:** The pump types are not available in all variants.



## Nameplate



TM05 8872 2813

**Fig. 2** DP, EF, SL1 and SLV pumps

Pos.	Description	Pos.	Description
1	Type designation	15	Run capacitor [ $\mu$ F]
2	Product number	16	RCM logo***
3	Approval	17	CE mark
4	ATEX certificate no*	18	Declaration of performance
5	IEC Ex description*	19	Ex description
6	IEC Ex certificate no*	20	Maximum installation depth [m]
7	Production code (year/week)	21	Maximum flow [l/s]
8	Enclosure class to IEC	22	Rated power output [kW]
9	Maximum head [m]	23	Rated current [A]
10	Rated input power [kW]	24	Cos $\phi$ , 1/1 load
11	Rated voltage	25	Maximum liquid temperature [ $^{\circ}$ C]
12	Speed [ $\text{min}^{-1}$ ]	26	Frequency [Hz]
13	Net weight [kg]	27	Insulation class / temperature rise
14	EAC approval**	28	Production country

\* Only explosion-proof pumps.

\*\* For Russia only.

\*\*\* For Australia only.

## 3. Selection of product

### Ordering a pump

When ordering a pump, you need to take the following aspects into consideration:

- pump type
- custom-built variation (option)
- accessories
- controller
- explosion-proof version.

### Pump

Use the table below to identify the pump type that best meets your needs. The table is for guidance only.

Pumped liquid	DP	EF	SL1	SLV
Storm water			•	•
Groundwater	•	•	•	•
Drainage and surface water	•	•	•	•
Drainage and surface water with small impurities	•	•	•	•
Abrasive surface water	•	•	•	•
Wastewater with long fibres, e.g. from laundries		•	•	•
Wastewater from commercial buildings without discharge from toilets		•	•	•
Domestic wastewater with discharge from toilets			•	•
Industrial process water with solids or fibres				•
Industrial process water with solids		•	•	•
Industrial process water without solids and fibres	•	•	•	

When you have selected the pump type, you can identify the specific pump that best meets your needs in sections *Product range*, pages 11 to 17, and *Type keys*, pages 6 to 7.

The list below is a detailed description of the product you get if you order the following pump:

Pump	Product number
SLV.65.65.15.Ex.2.50B	96104193

- Pump as specified in the type key.
- 10 metres of cable.
- Paint: NCS 9000N (black), gloss code 30, thickness 100 µm.
- Three thermal switches, one in each phase, or three thermal sensors (PTC).
- Tested according to DIN 9906:2012, grade 3B.

See section *Performance curves and technical data*, pages 49 to 69 for selection of a pump.

**Note:** Pump-specific data can also be found on [www.grundfos.com](http://www.grundfos.com) (Grundfos Product Center) by entering the product number 96104193.

For further information about Grundfos Product Center, see page 84.

### Custom-built variants

The pumps can be customised to meet individual requirements. Many pump features and options are available for customisation, such as explosion-proof versions, cable lengths or special materials.

**Note:** Please make sure to have at least 3 metres of cable above the maximum liquid level. If this is not possible with the standard cable, Grundfos offer variants with longer cables. Grundfos do not recommend extending the existing cable.

### Accessories

Depending on installation type and pump variant, accessories may be required. See section *Accessories*, page 77, for selection of the correct accessories.

**Note:** Ordered accessories are not fitted from factory.

### Controller

The following controllers are available:

#### DP, EF, SL1 and SLV, standard

- Dedicated Controls. See also page 80.
- LC and LCD 107 operated by air bells. See also page 81.
- LC and LCD 108 operated by float switches. See also page 81.
- LC and LCD 110 operated by electrodes. See also page 81.
- CU 100. See also page 81.

#### DP, EF, SL1 and SLV, AUTO<sub>ADAPT</sub>

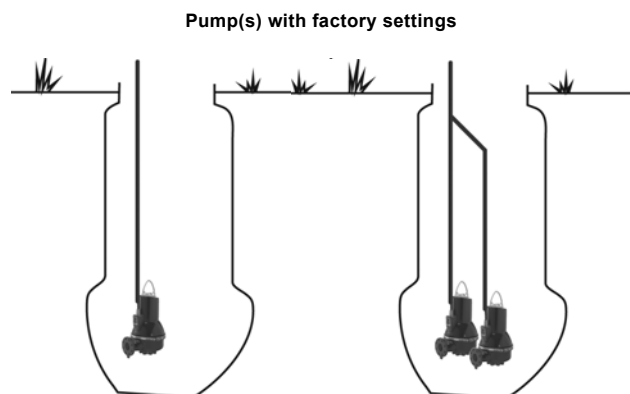
- Built-in controller. See also page 5.
- Grundfos CIU unit. See also page 82.
- Grundfos GO remote control. See also page 82.

### Explosion-proof version

All pump ranges are available in explosion-proof versions. See section *Approvals* on page 45.



## Selection of AUTO<sub>ADAPT</sub> applications

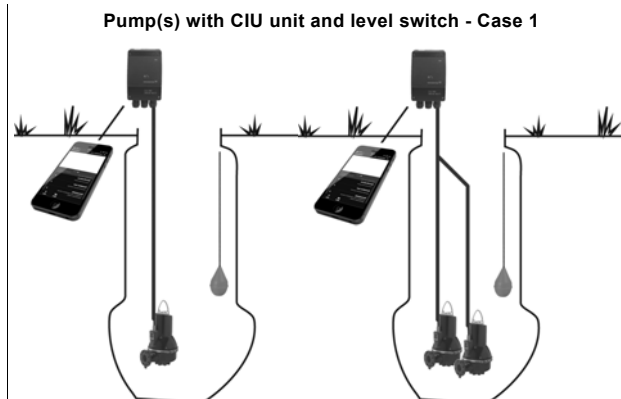


**Fig. 3** Configuration for one or two AUTO<sub>ADAPT</sub> pumps

Configuration for one or two AUTO<sub>ADAPT</sub> pumps with factory settings:

- alarm relay integrated in pump(s)
- no need for change in settings or data communication.

TM06 4350 2015 - TM06 4354 2015



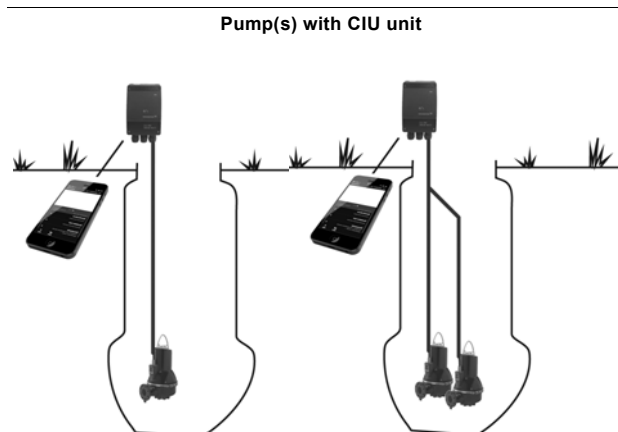
**Fig. 4** Configuration for one or two AUTO<sub>ADAPT</sub> pumps with CIU unit and level switch - Case 1

Configuration for one or two AUTO<sub>ADAPT</sub> pumps with one level switch and one CIU for data communication:

- need for high level alarm indication only
- CIU unit to consider:
  - CIU 902 or
  - CIU 902 + CIM 060.

**Note:** Changes in settings are done by means of infra red- or radio communication via Grundfos GO.

TM06 4352 2015 - TM06 4356 2015



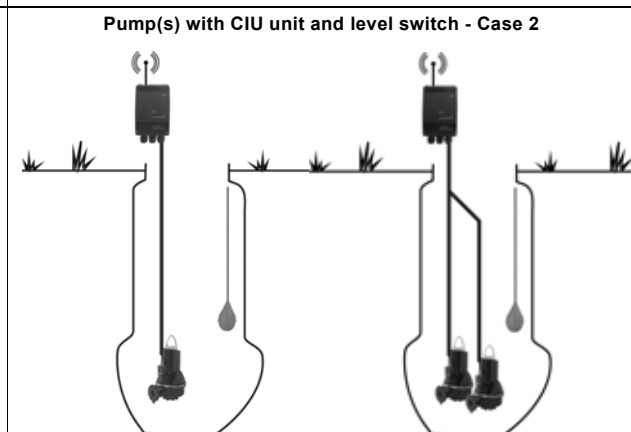
**Fig. 5** Configuration for one or two AUTO<sub>ADAPT</sub> pumps with CIU unit

Configuration for one or two AUTO<sub>ADAPT</sub> pumps with 1 CIU unit for data communication:

- need for data change in settings
- CIU unit to consider:
  - CIU 902 or
  - CIU 902 + CIM 060.

**Note:** Changes in settings are done by means of infra red- or radio communication via Grundfos GO.

TM06 4351 2015 - TM06 4355 2015



**Fig. 6** Configuration for one or two AUTO<sub>ADAPT</sub> pumps with CIU unit and level switch - Case 2

Configuration for one or two AUTO<sub>ADAPT</sub> pump with one level switch and one CIU for data communication:

- need for high level alarm indication and/or data communication
- CIU unit to consider:
  - CIU 202 for wired Modbus RTU
  - CIU 152 for Profibus DP
  - CIU 252 for GSM/GPRS
  - CIU 272 for GRM.

TM06 4353 2015 - TM06 4357 2015

## 4. Performance range

### Performance overview

Figure 7 shows the performance range of DP, EF, SL1 and SLV standard and AUTO<sub>ADAPT</sub> pumps as well as the explosion-proof versions.

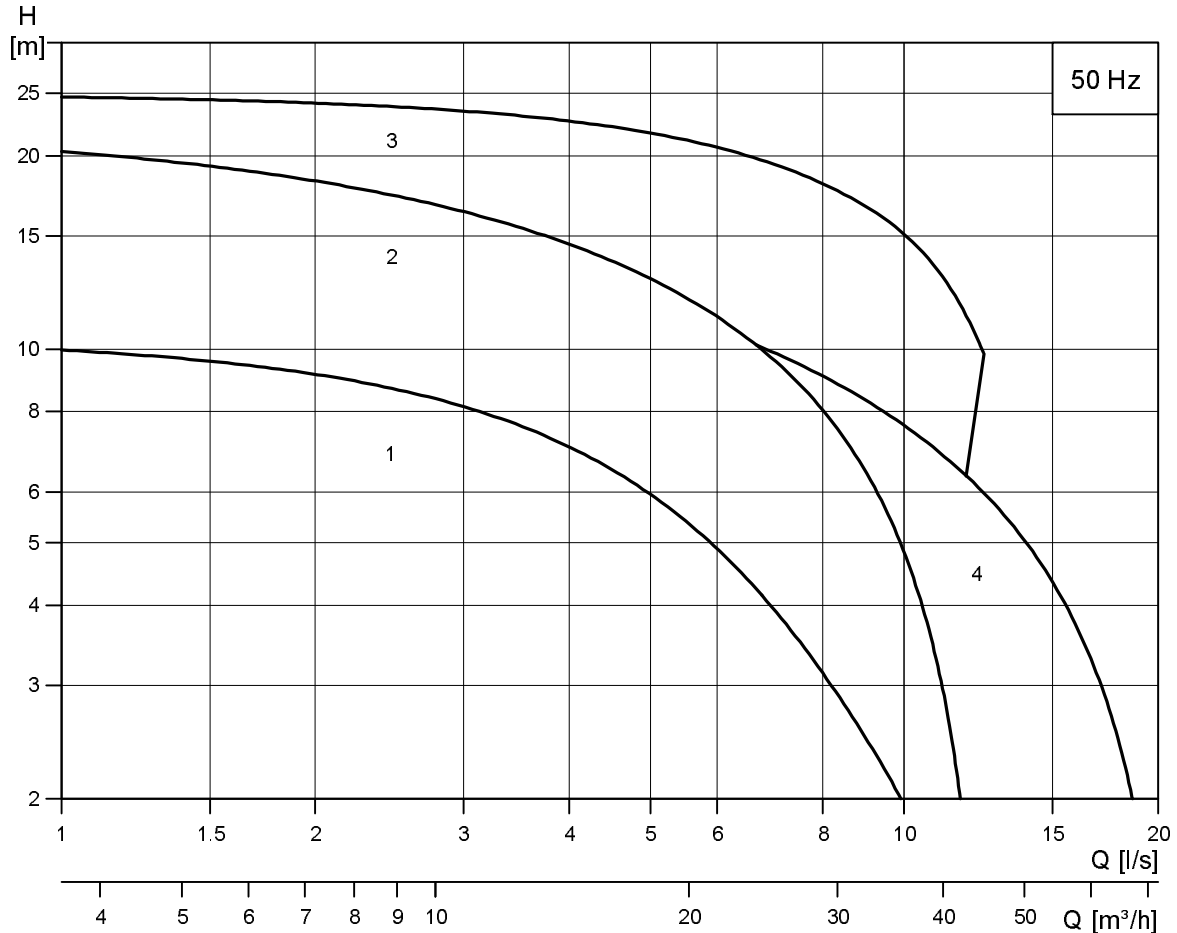


Fig. 7 Performance range

Pump type	Curve chart on page
DP10.50.09.(A)/(E).(Ex).2.1.502	49
3 DP10.50.09.(A)/(E).(Ex).2.50B	50
DP10.50.15.(A)/(E).(Ex).2.50B	51
DP10.65.26.(A)/(E).(Ex).2.50B	52
EF30.50.06.(A)/(E).(Ex).2.1.502	53
EF30.50.06.(A)/(E).(Ex).2.50B	54
EF30.50.09.(A)/(E).(Ex).2.1.502	55
2 EF30.50.09.(A)/(E).(Ex).2.50B	56
EF30.50.11.(A)/(E).(Ex).2.1.502	57
EF30.50.11.(A)/(E).(Ex).2.50B	58
EF30.50.15.(A)/(E).(Ex).2.50B	59
SL1.50.65.09.(A)/(E).(Ex).2.1.502	60
SL1.50.65.09.(A)/(E).(Ex).2.50B/C	61
4 SL1.50.65.11.(A)/(E).(Ex).2.1.502	62
SL1.50.65.11.(A)/(E).(Ex).2.50B/C	63
SL1.50.65.15.(A)/(E).(Ex).2.50B/C	64
SLV.65.65.09.(A)/(E).(Ex).2.1.502	65
SLV.65.65.09.(A)/(E).(Ex).2.502B	66
1 SLV.65.65.11.(A)/(E).(Ex).2.1.502	67
SLV.65.65.11.(A)/(E).(Ex).2.50B	68
SLV.65.65.15.(A)/(E).(Ex).2.50B	69

TM04 6698 0710

## 5. Product range

### Standard pumps

#### DP10, standard

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.2.1.502	96104200	1 x 230 V D	10	Thermal switch
DP10.50.09.A.2.1.502	96104202	1 x 230 V D	10	Thermal switch
DP10.50.09.2.50B	96104204	3 x 400-415 V Y	10	Thermal switch
DP10.50.09.A.2.50B	96104206	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.2.50B	96104208	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.A.2.50B	96104210	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.2.50B	96106542	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.A.2.50B	96106544	3 x 400-415 V Y	10	Thermal switch

#### DP10, AUTO<sub>ADAPT</sub>

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.E.2.1.502	96877476	1 x 230 V	10	Thermal switch
DP10.50.09.E.2.50B	96877478	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.E.2.50B	96877503	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.E.2.50B	96877506	3 x 400-415 V Y	10	Thermal switch

#### DP10, standard, Norway

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.2.50C	96566074	3 x 230-240 V D	10	Thermal switch
DP10.50.09.A.2.50C	96566075	3 x 230-240 V D	10	Thermal switch
DP10.50.15.2.50C	96566078	3 x 230-240 V D	10	Thermal switch
DP10.50.15.A.2.50C	96566079	3 x 230-240 V D	10	Thermal switch
DP10.65.26.2.50C	96566081	3 x 230-240 V D	10	Thermal switch
DP10.65.26.A.2.50C	96566082	3 x 230-240 V D	10	Thermal switch

**EF30, standard**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
EF30.50.06.2.1.502	96106546	1 x 230 V D	10	Thermal switch
EF30.50.06.A.2.1.502	96106548	1 x 230 V D	10	Thermal switch
EF30.50.06.2.50B	96106550	3 x 400-415 V Y	10	Thermal switch
EF30.50.06.A.2.50B	96106552	3 x 400-415 V Y	10	Thermal switch
EF30.50.09.2.1.502	96115111	1 x 230 V D	10	Thermal switch
EF30.50.09.A.2.1.502	96115113	1 x 230 V D	10	Thermal switch
EF30.50.09.2.50B	96115115	3 x 400-415 V Y	10	Thermal switch
EF30.50.09.A.2.50B	96115117	3 x 400-415 V Y	10	Thermal switch
EF30.50.11.2.1.502	96106554	1 x 230 V D	10	Thermal switch
EF30.50.11.A.2.1.502	96106556	1 x 230 V D	10	Thermal switch
EF30.50.11.2.50B	96106558	3 x 400-415 V Y	10	Thermal switch
EF30.50.11.A.2.50B	96106560	3 x 400-415 V Y	10	Thermal switch
EF30.50.15.2.50B	96104196	3 x 400-415 V Y	10	Thermal switch
EF30.50.15.A.2.50B	96104198	3 x 400-415 V Y	10	Thermal switch

**EF30, AUTO<sub>ADAPT</sub>**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
EF30.50.06.E.2.1.502	96877508	1 x 230 V	10	Thermal switch
EF30.50.06.E.2.50B	96877510	3 x 400-415 V Y	10	Thermal switch
EF30.50.09.E.2.1.502	96877515	1 x 230 V	10	Thermal switch
EF30.50.09.E.2.50B	96877516	3 x 400-415 V Y	10	Thermal switch
EF30.50.11.E.2.1.502	96875101	1 x 230 V	10	Thermal switch
EF30.50.11.E.2.50B	96878445	3 x 400-415 V Y	10	Thermal switch
EF30.50.15.E.2.50B	96878448	3 x 400-415 V Y	10	Thermal switch

**EF30, standard, Norway**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
EF30.50.06.2.50C	96566084	3 x 230-240 V D	10	Thermal switch
EF30.50.06.A.2.50C	96566086	3 x 230-240 V D	10	Thermal switch
EF30.50.09.2.50C	96566088	3 x 230-240 V D	10	Thermal switch
EF30.50.11.2.50C	96566091	3 x 230-240 V D	10	Thermal switch
EF30.50.11.A.2.50C	96566092	3 x 230-240 V D	10	Thermal switch
EF30.50.15.2.50C	96566094	3 x 230-240 V D	10	Thermal switch
EF30.50.15.A.2.50C	96566095	3 x 230-240 V D	10	Thermal switch

**SL1, standard**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SL1.50.65.09.2.1.502	96106562	1 x 230 V D	10	Thermal switch
SL1.50.65.09.2.50C	96106567	3 x 230-240 V D	10	Thermal switch
SL1.50.65.09.2.50B	96106566	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.09.A.2.1.502	96106564	1 x 230 V D	10	Thermal switch
SL1.50.65.09.A.2.50C	96106571	3 x 230-240 V D	10	Thermal switch
SL1.50.65.09.A.2.50B	96106570	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.2.1.502	96104125	1 x 230 V D	10	Thermal switch
SL1.50.65.11.2.50C	96104130	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.2.50B	96104129	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.A.2.1.502	96104127	1 x 230 V D	10	Thermal switch
SL1.50.65.11.A.2.50C	96104134	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.A.2.50B	96104133	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.2.50C	96104119	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.2.50B	96104118	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.A.2.50C	96104123	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.A.2.50B	96104122	3 x 400-415 V Y	10	Thermal switch

**SL1, AUTO<sub>ADAPT</sub>**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SL1.50.65.09.E.2.1.502	96878450	1 x 230 V	10	Thermal switch
SL1.50.65.09.E.2.50B	96878451	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.E.2.1.502	96878454	1 x 230 V	10	Thermal switch
SL1.50.65.11.E.2.50B	96878455	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.E.2.50B	96878458	3 x 400-415 V Y	10	Thermal switch

**SL1, standard, Norway**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SL1.50.65.09.2.50C	96106567	3 x 230-240 V D	10	Thermal switch
SL1.50.65.09.A.2.50C	96106571	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.2.50C	96104130	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.A.2.50C	96104134	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.2.50C	96104119	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.A.2.50C	96104123	3 x 230-240 V D	10	Thermal switch

**SLV, standard**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SLV65.65.09.2.1.502	96115119	1 x 230 V D	10	Thermal switch
SLV65.65.09.2.50B	96115123	3 x 400-415 V Y	10	Thermal switch
SLV65.65.09.A.2.1.502	96115121	1 x 230 V D	10	Thermal switch
SLV65.65.09.A.2.50B	96115125	3 x 400-415 V Y	10	Thermal switch
SLV65.65.11.2.1.502	96106573	1 x 230 V D	10	Thermal switch
SLV65.65.11.2.50B	96106577	3 x 400-415 V Y	10	Thermal switch
SLV65.65.11.A.2.1.502	96106575	1 x 230 V D	10	Thermal switch
SLV65.65.11.A.2.50B	96106579	3 x 400-415 V Y	10	Thermal switch
SLV65.65.15.2.50B	96104192	3 x 400-415 V Y	10	Thermal switch
SLV65.65.15.A.2.50B	96104194	3 x 400-415 V Y	10	Thermal switch

**SLV, AUTO<sub>ADAPT</sub>**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SLV65.65.09.E.2.1.502	96878474	1 x 230 V	10	Thermal switch
SLV65.65.09.E.2.50B	96878475	3 x 400-415 V Y	10	Thermal switch
SLV65.65.11.E.2.1.502	96882685	1 x 230 V	10	Thermal switch
SLV65.65.11.E.2.50B	96882686	3 x 400-415 V Y	10	Thermal switch
SLV65.65.15.E.2.50B	96878503	3 x 400-415 V Y	10	Thermal switch

## Explosion-proof pumps

### DP10, Ex

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.Ex.2.1.502	96104201	1 x 230 V D	10	Thermal switch
DP10.50.09.Ex.2.50B	96104205	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.Ex.2.50B	96104209	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.Ex.2.50B	96106543	3 x 400-415 V Y	10	Thermal switch

### DP10, AUTO<sub>ADAPT</sub> Ex

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.E.Ex.2.1.502	96877479	1 x 230 V	10	Thermal switch
DP10.50.09.E.Ex.2.50B	96877502	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.E.Ex.2.50B	96877504	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.E.Ex.2.50B	96877507	3 x 400-415 V Y	10	Thermal switch

### DP10, Ex, Norway

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.Ex.2.50C	96566076	3 x 230-240 V D	10	Thermal switch
DP10.50.15.Ex.2.50C	96566080	3 x 230-240 V D	10	Thermal switch
DP10.65.26.Ex.2.50C	96566083	3 x 230-240 V D	10	Thermal switch

### DP10, Ex, Australia

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
DP10.50.09.Ex.2.1.502	96104203	1 x 230 V D	10	Thermal switch
DP10.50.09.Ex.2.50B	96104207	3 x 400-415 V Y	10	Thermal switch
DP10.50.15.Ex.2.50B	96104211	3 x 400-415 V Y	10	Thermal switch
DP10.65.26.Ex.2.50B	96106545	3 x 400-415 V Y	10	Thermal switch



**EF30, Ex**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
EF30.50.06.Ex.2.1.502	96106547	1 x 230 V D	10	Thermal switch
EF30.50.06.Ex.2.50B	96106551	3 x 400-415 V Y	10	Thermal switch
EF30.50.09.Ex.2.1.502	96115112	1 x 230 V D	10	Thermal switch
EF30.50.09.Ex.2.50B	96115116	3 x 400-415 V Y	10	Thermal switch
EF30.50.11.Ex.2.1.502	96106555	1 x 230 V D	10	Thermal switch
EF30.50.11.Ex.2.50B	96106559	3 x 400-415 V Y	10	Thermal switch
EF30.50.15.Ex.2.50B	96104197	3 x 400-415 V Y	10	Thermal switch

**EF30, AUTO<sub>ADAPT</sub> Ex**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
EF30.50.06.E.Ex.2.1.502	96877512	1 x 230 V	10	Thermal switch
EF30.50.06.E.Ex.2.50B	96877514	3 x 400-415 V Y	10	Thermal switch
EF30.50.09.E.Ex.2.1.502	96877518	1 x 230 V	10	Thermal switch
EF30.50.09.E.Ex.2.50B	96877532	3 x 400-415 V Y	10	Thermal switch
EF30.50.11.E.Ex.2.1.502	96878446	1 x 230 V	10	Thermal switch
EF30.50.11.E.Ex.2.50B	96878447	3 x 400-415 V Y	10	Thermal switch
EF30.50.15.E.Ex.2.50B	96878449	3 x 400-415 V Y	10	Thermal switch

**EF30, Ex, Norway**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
EF30.50.06.Ex.2.50C	96566087	3 x 230-240 V D	10	Thermal switch
EF30.50.09.Ex.2.50C	96566090	3 x 230-240 V D	10	Thermal switch
EF30.50.11.Ex.2.50C	96566093	3 x 230-240 V D	10	Thermal switch
EF30.50.15.Ex.2.50C	96566096	3 x 230-240 V D	10	Thermal switch

**EF30, Ex, Australia**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
EF30.50.Ex.06.2.1.502	96106549	1 x 230 V D	10	Thermal switch
EF30.50.Ex.06.2.50B	96106553	3 x 400-415 V Y	10	Thermal switch
EF30.50.Ex.09.2.1.502	96115114	1 x 230 V D	10	Thermal switch
EF30.50.Ex.09.2.50B	96115118	3 x 400-415 V Y	10	Thermal switch
EF30.50.Ex.11.2.1.502	96106557	1 x 230 V D	10	Thermal switch
EF30.50.Ex.11.2.50B	96106561	3 x 400-415 V Y	10	Thermal switch
EF30.50.Ex.15.2.50B	96104199	3 x 400-415 V Y	10	Thermal switch

**SL1, Ex**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
SL1.50.65.09.Ex.2.1.502	96106563	1 x 230 V D	10	Thermal switch
SL1.50.65.09.Ex.2.50C	96106569	3 x 230-240 V D	10	Thermal switch
SL1.50.65.09.Ex.2.50B	96106568	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.Ex.2.1.502	96104126	1 x 230 V D	10	Thermal switch
SL1.50.65.11.Ex.2.50C	96104132	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.Ex.2.50B	96104131	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.Ex.2.50C	96104121	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.Ex.2.50B	96104120	3 x 400-415 V Y	10	Thermal switch

**SL1, AUTO<sub>ADAPT</sub> Ex**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
SL1.50.65.09.E.Ex.2.1.502	96878452	1 x 230 V	10	Thermal switch
SL1.50.65.09.E.Ex.2.50B	96878453	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.E.Ex.2.1.502	96878456	1 x 230 V	10	Thermal switch
SL1.50.65.11.E.Ex.2.50B	96878457	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.E.Ex.2.50B	96878472	3 x 400-415 V Y	10	Thermal switch

**SL1, Ex, Norway**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
SL1.50.65.09.Ex.2.50C	96106569	3 x 230-240 V D	10	Thermal switch
SL1.50.65.11.Ex.2.50C	96104132	3 x 230-240 V D	10	Thermal switch
SL1.50.65.15.Ex.2.50C	96104121	3 x 230-240 V D	10	Thermal switch

**SL1, Ex, Australia**

Pump type	Product number	Voltage [V]	Cable length [m]	Thermal protection
SL1.50.65.09.Ex.2.1.502	96106565	1 x 230 V D	10	Thermal switch
SL1.50.65.09.Ex.2.50B	96106572	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.11.Ex.2.1.502	96104128	1 x 230 V D	10	Thermal switch
SL1.50.65.11.Ex.2.50B	96104135	3 x 400-415 V Y	10	Thermal switch
SL1.50.65.15.Ex.2.50B	96104124	3 x 400-415 V Y	10	Thermal switch

**SLV, Ex**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SLV65.65.09.Ex.2.1.502	96115120	1 x 230 V D	10	Thermal switch
SLV65.65.09.Ex.2.50B	96115124	3 x 400-415 V Y	10	Thermal switch
SLV65.65.11.Ex.2.1.502	96106574	1 x 230 V D	10	Thermal switch
SLV65.65.11.Ex.2.50B	96106578	3 x 400-415 V Y	10	Thermal switch
SLV.65.65.15.Ex.2.50B	96104193	3 x 400-415 V Y	10	Thermal switch

**SLV, AUTO<sub>ADAPT</sub> Ex**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SLV65.65.09.E.Ex.2.1.502	96878476	1 x 230 V	10	Thermal switch
SLV65.65.09.E.Ex.2.50B	96878477	3 x 400-415 V Y	10	Thermal switch
SLV65.65.11.E.Ex.2.1.502	96878480	1 x 230 V	10	Thermal switch
SLV65.65.11.E.Ex.2.50B	96878481	3 x 400-415 V Y	10	Thermal switch
SLV65.65.15.E.Ex.2.50B	96878504	3 x 400-415 V Y	10	Thermal switch

**SLV, Ex, Australia**

Pump type	Product number	Voltage	Cable length	Thermal protection
		[V]	[m]	
SLV.65.65.Ex.09.2.1.502	96115122	1 x 230 V D	10	Thermal switch
SLV.65.65.Ex.09.2.50B	96115126	3 x 400-415 V Y	10	Thermal switch
SLV.65.65.Ex.11.2.1.502	96106576	1 x 230 V D	10	Thermal switch
SLV.65.65.Ex.11.2.50B	96106580	3 x 400-415 V Y	10	Thermal switch
SLV.65.65.Ex.15.2.50B	96104195	3 x 400-415 V Y	10	Thermal switch

## 6. Variants

### List of variants

Motor		
		15 m
		20 m
Standard cables	Cable B, 4 G 1.5 mm <sup>2</sup> + 3 x 1 mm <sup>2</sup>	25 m
		30 m
		40 m
		50 m
		15 m
Ex cables	Cable B, 4 G 1.5 mm <sup>2</sup> + 3 x 1 mm <sup>2</sup> , Ex	20 m
		25 m
		30 m
		40 m
		50 m
Screened power cables for frequency converters <b>Note:</b> only for standard pumps, not for AUTO <sub>ADAPT</sub> pumps	Screened cable B, Ex	10 m
		15 m
		20 m
		25 m
		30 m
		40 m
Cable protection hose	For 7-core cable	
Special motor	Special voltage With or without PTC, etc.	
Tests		
Test at specified duty on standard impeller curve		
Trimmed impeller for specified duty test		
Additional test of entire QH curve (including report)	5 to 10 flows from pump performance curve.	
Different test standard	Efficiency guaranteed by Grundfos.	ISO 9906:2012 grade 2B tolerances.
Vibration test (including report)	According to Grundfos factory quality standard.	
NPSHr test	Not yet available.	
String test	Contact Grundfos.	
Witness test	Contact Grundfos.	
Certificates		
ATEX-approved pump report	Special Grundfos report. Contact Grundfos.	
Certificate of compliance with order	According to EN 10204 2.1.	According to Annex A grade 2.
Pump certificate	According to EN 10204 2.2.	According to Annex A grade 2.
Inspection certificate	According to EN 10204 3.1.	According to Annex A grade 2.
Material specification report	According to EN 10204 3.1B.	
Material report with certificate	According to EN 10204 3.2.	Material supplier information.
Inspection certificate Lloyds Register	According to EN 10204 3.2.	
Inspection certificate DNV (Det Norske Veritas)	According to EN 10204 3.2.	
Inspection certificate Germanischer Lloyd	According to EN 10204 3.2.	
Inspection certificate American Bureau of Shipping	According to EN 10204 3.2.	
Inspection certificate Bureau Veritas	According to EN 10204 3.2.	
Registro Italiano Navale Argenteure	According to EN 10204 3.2.	
Other 3rd party test certificate	Contact Grundfos.	
Miscellaneous		
Special packaging	Contact Grundfos.	
Special nameplate	Contact Grundfos.	
Other variants	Contact Grundfos.	
Chemical-resistant shaft seal	FKM, standard (NBR).	
Chemical-resistant pump	FKM, standard (NBR).	
Internal surface treatment	Ceramic coating (impeller and pump housing).	
	Extra epoxy (CED) coating.	
Top coating	Black (RAL 9005).	
	Other colour.	

## 7. Construction

### Material specification, DP and EF, standard pumps

The position numbers in the table below refer to the sectional drawings and exploded views on the following pages.

Pos.	Description	Material	EN standard	AISI/ASTM
6a	Pin	Stainless steel		
7a	Rivet	Stainless steel	1.4301	304
9a	Key	Stainless steel		
26a	O-ring	NBR		
37	O-ring	NBR		
37a	O-rings	NBR		
37b	O-rings	NBR		
48	Stator			
48a	Cover			
49	Impeller	Cast iron	EN-GJS-500-7	
50	Pump housing	Cast iron	EN-GJL-250	
55	Stator housing	Cast iron	EN-JL-1030	
58	Shaft seal carrier	Cast iron	EN-JL-1030	
66	Locking ring	Stainless steel		
76	Nameplate	Stainless steel	1.4301	304
84	Strainer*	Cast iron		
92	Clamp	Stainless steel	1.4301	304
102	O-ring	NBR		
103	Bush	Stainless steel	1.4057	431
104	Seal ring	NBR		
105/105a	Shaft seal	Primary seal (0.6 to 1.5 kW): SiC/SiC Secondary seal (0.6 to 1.5 kW): lip seal, NBR Primary seal (2.6 kW): SiC/SiC Secondary seal (2.6 kW): carbon/aluminium oxide Other components: NBR, stainless steel		
107	O-rings	NBR		
150a	Stator housing complete			
153	Bearing (lower)	Up to and including 1.5 kW: 6204 2.6 kW: 3205		
153a	Washer			
153b	Washer			
154	Bearing (upper)	Up to 1.5 kW: Single-row ball bearing 6301 2.6 kW: Single-row ball bearing 6205		
155	Oil chamber	Cast iron		
157	Washer			
158	Corrugated spring	Steel		
159	O-ring	NBR		
162	Wear plate	Cast iron		
172	Rotor Shaft		1.1181 1.4301	304
173	Screw	Steel		
173a	Washer	Steel		
176	Inner plug part	PET		
181	Outer plug part	CR rubber, cable LYNIFLEX	1.4308	CF-8
188a	Screw	Stainless steel		
188b	Locking screw			
188c	Locking screw			
189	Adjusting screw			
190	Lifting bracket	Stainless steel	1.4308	CF-8
193	Oil screw	Stainless steel		
193a	Oil	Shell Ondina X420		
194	Gasket	Nylon		
198	O-ring	NBR		
	Paint	Two-component epoxy		

\* Only DP pumps

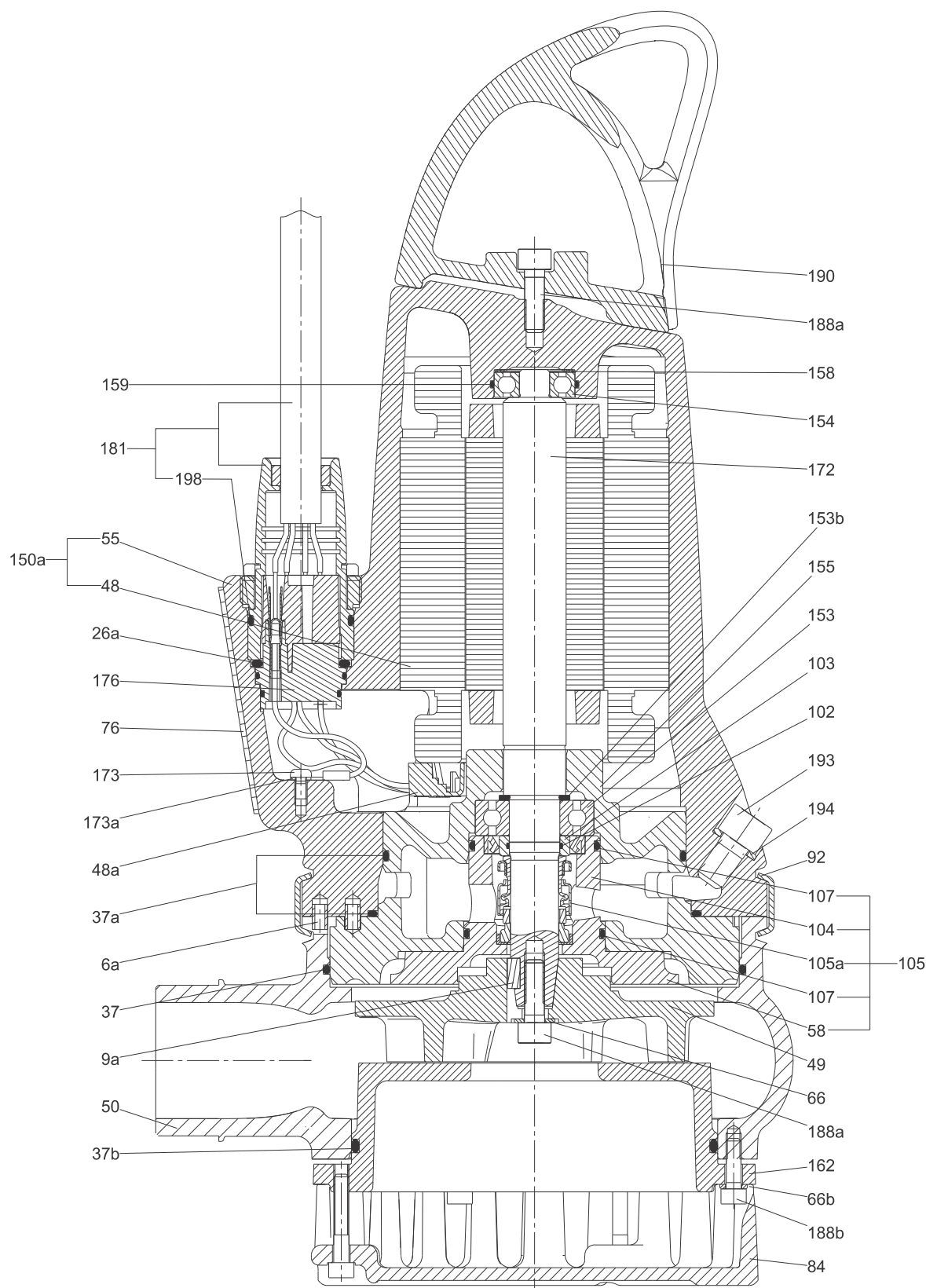


Fig. 8 Sectional drawing, DP10.50.09/15

TM06 6113 0716



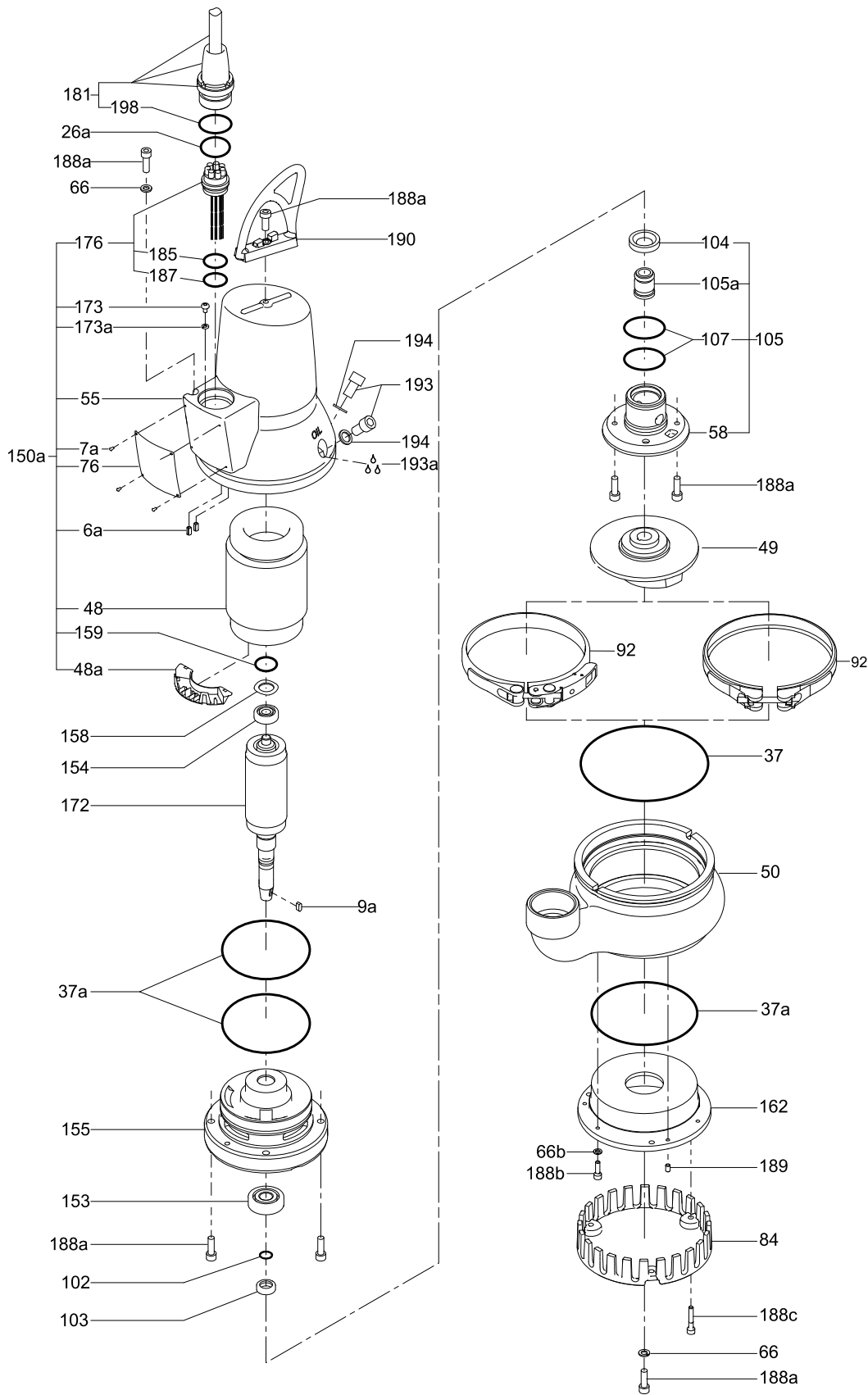


Fig. 9 Exploded view, DP10.50.09/15

TM06 5868 0316

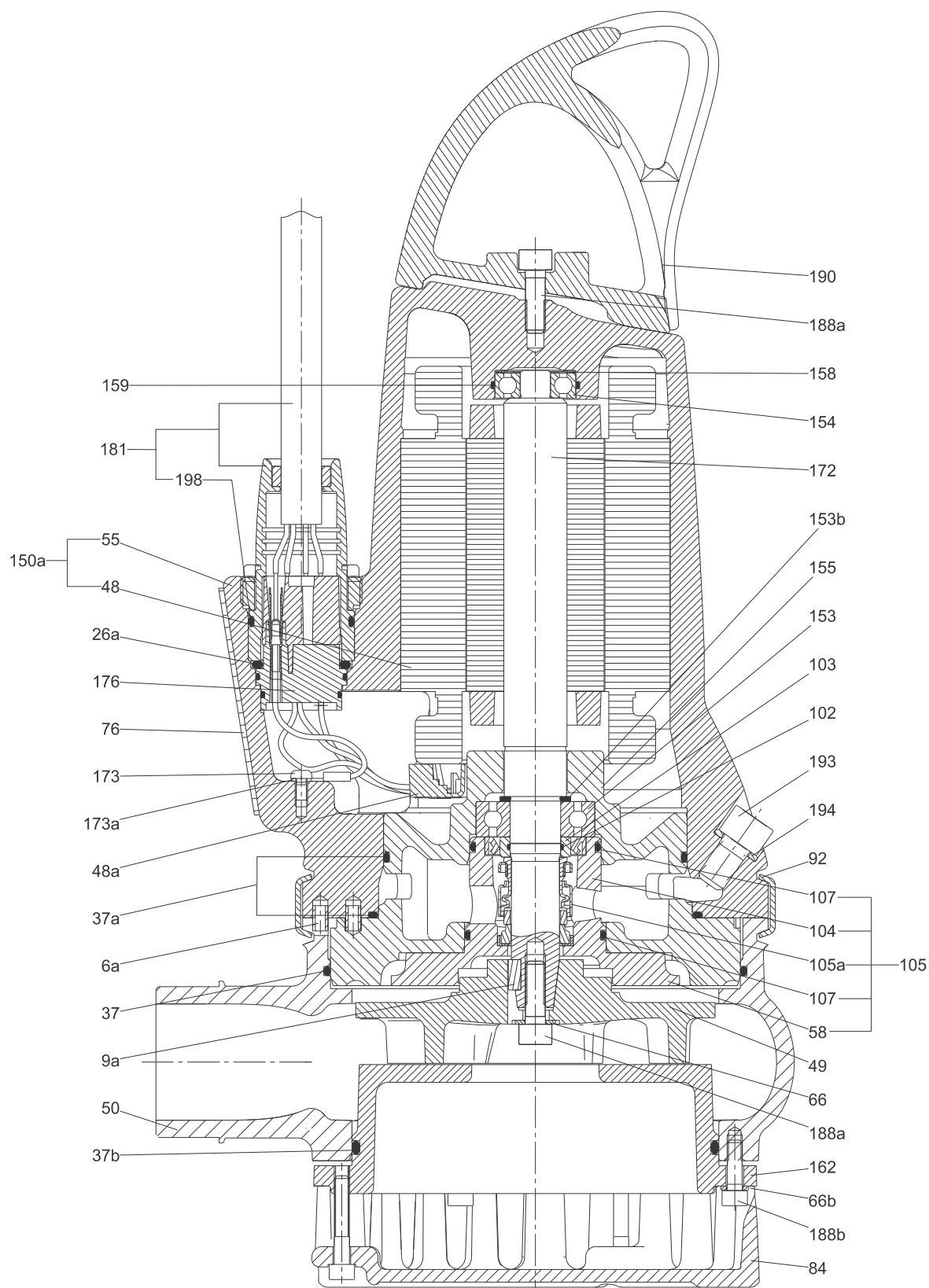


Fig. 10 Sectional drawing, DP10.65.26

TM06 6113 0716

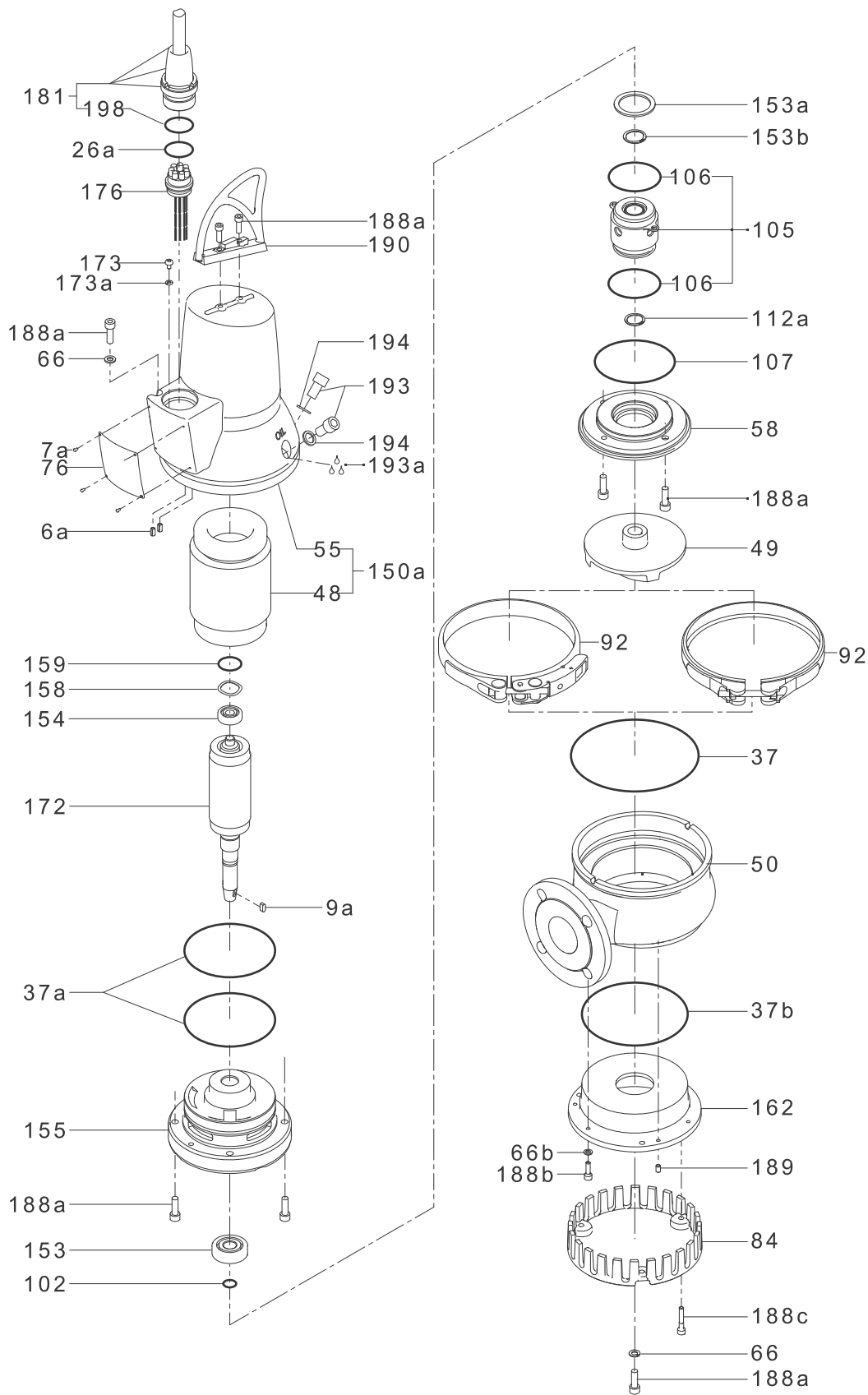


Fig. 11 Exploded view, DP10.65.26

TM06 5884 0316

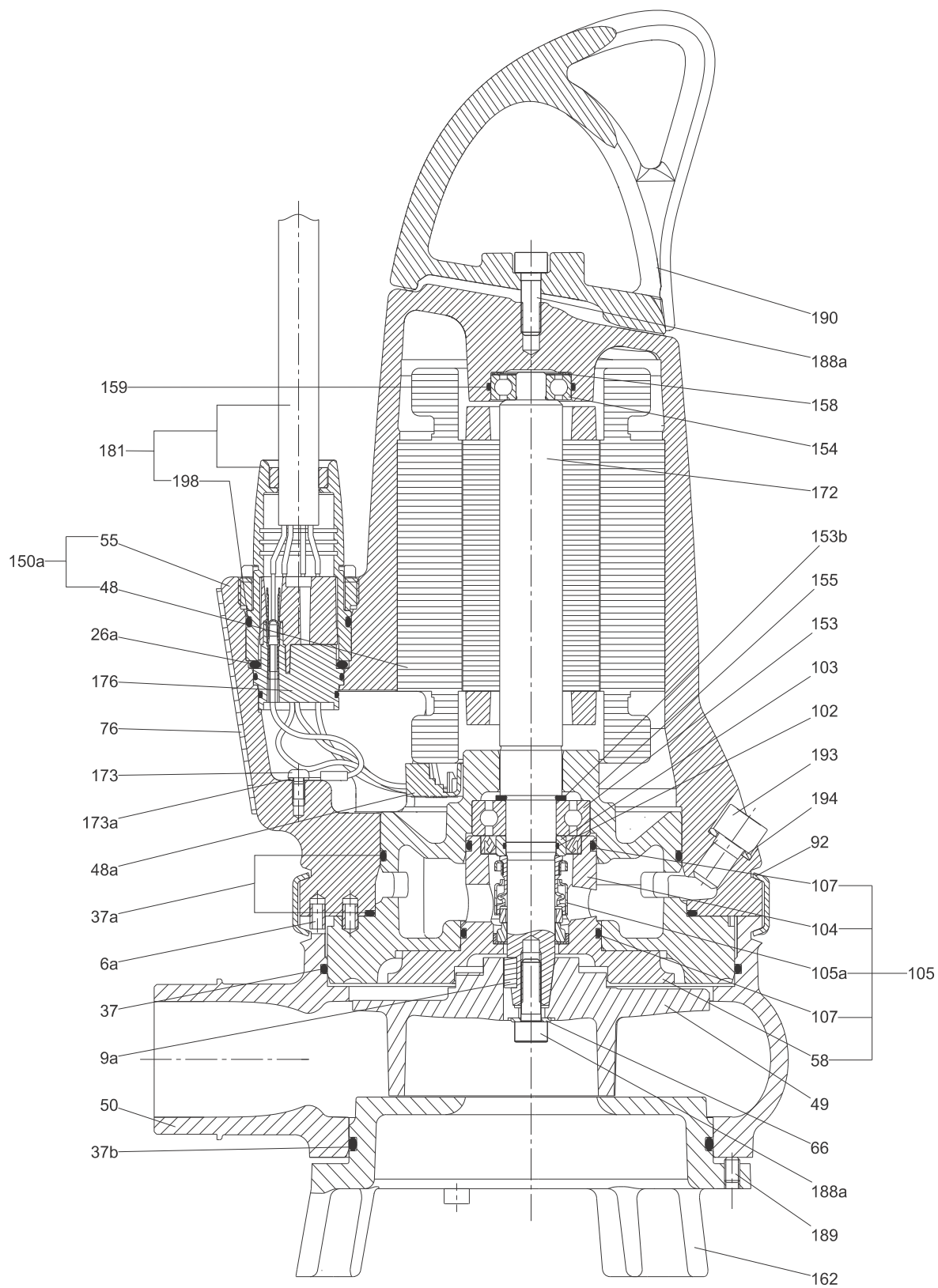


Fig. 12 Sectional drawing, EF

TM06 6121 0716

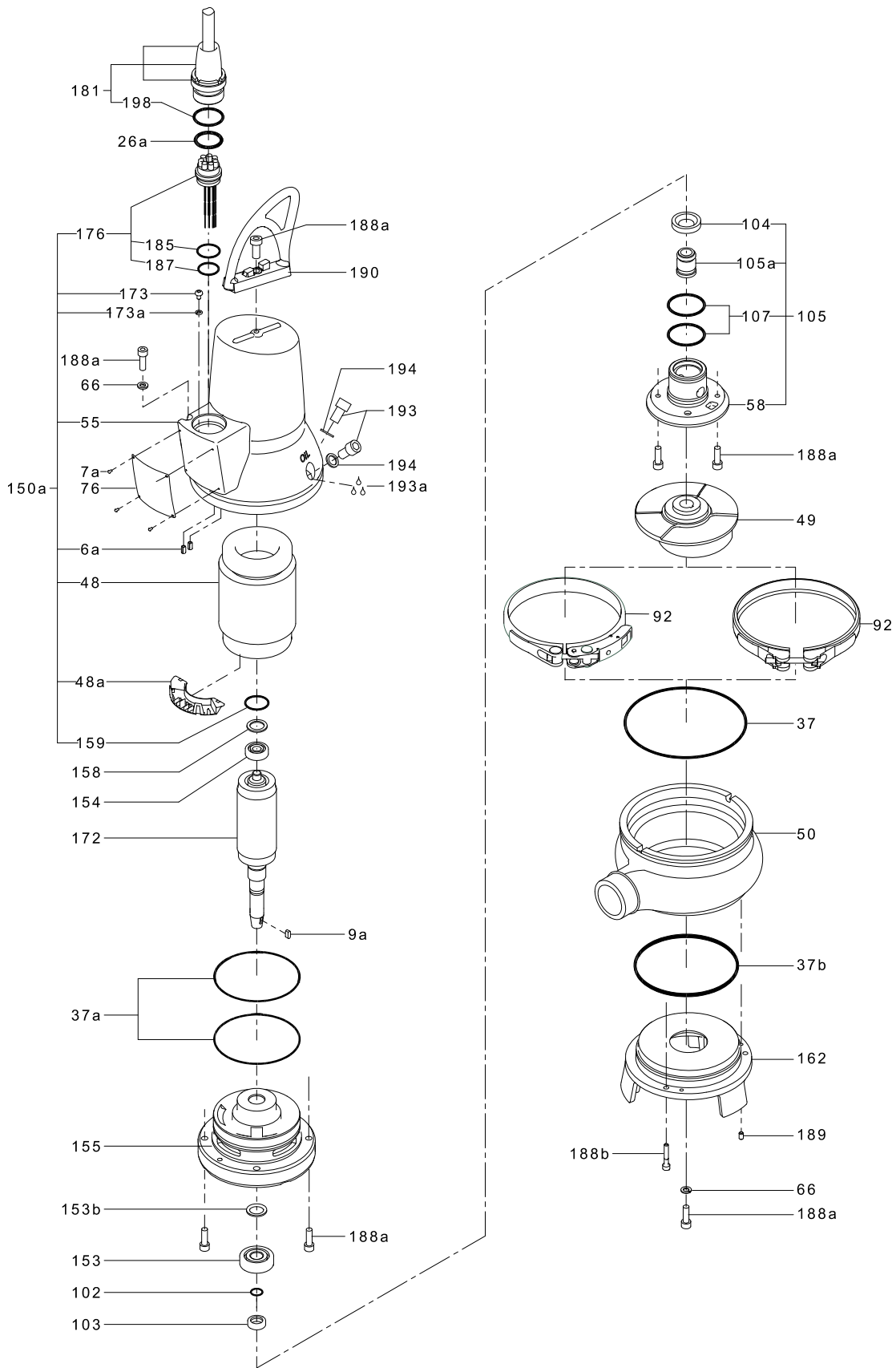


Fig. 13 Exploded view, EF

TM06 5905 0316

## Material specification, DP 10 and EF, AUTO<sub>ADAPT</sub> pumps

The position numbers in the table below refer to the sectional drawings and exploded views on the following pages.

Pos.	Description	Material	EN standard	AISI/ASTM
6a	Pin	Stainless steel		
7a	Rivet	Stainless steel		
9a	Key	Stainless steel		
26a	O-ring			
37	O-ring			
37a	O-rings	NBR		
37b	O-ring			
48	Stator			
48a	Terminal board			
49	Impeller	Cast iron	EN-GJS-500-7	
50	Pump housing	Cast iron	EN-JL-1030	
55	Stator housing	Cast iron	EN-JL-1030	
58	Shaft seal carrier	Cast iron	EN-JL-1030	
66	Locking ring	Stainless steel		
76	Nameplate	Stainless steel	1.4301	304
84	Inlet strainer***	Cast iron		
90a	Electronic unit			
90b	O-ring			
92	Clamp	Stainless steel	1.4301	304
102	O-ring	NBR		
103	Bush	Stainless steel	1.4057	431
104	Seal ring	NBR		
105/105a	Shaft seal	Primary seal (0.6 to 1.5 kW): SiC/SiC Secondary seal (0.6 to 1.5 kW): lip seal, NBR Primary seal (2.6 kW): SiC/SiC Secondary seal (2.6 kW): carbon/aluminium oxide Other components: NBR, stainless steel		
107	O-rings	NBR		
153	Bearing (lower)	Up to and including 1.5 kW: 6204 2.6 kW and up: 3205		
154	Bearing (upper)	Up to and including 1.5 kW: 6201 2.6 kW: 6205		
155	Oil chamber			
158	Corrugated spring	Steel		
159	O-ring	NBR		
161b	Pt1000 sensor, with bracket			
161c	Run capacitor and Pt1000 sensor, with bracket*			
172	Rotor/shaft	Shaft part at rotor: steel Shaft end at hydraulics: stainless steel	1.1181 1.4301	304
173	Screw	Steel		
173a	Washer	Steel		
174	Earth screw			
174a	Washer			
176	Inner plug part	PET		
181	Outer plug part	CR rubber, cable LYNIFLEX	1.4308	CF-8
188a	Screw	Stainless steel		
188b	Locking screw	Steel		
188c	Screw	Steel		
189	Adjusting screw	Steel		
190	Lifting bracket	Stainless steel	1.4308	CF-8
193	Oil screw	Stainless steel		
193a	Oil	Shell Ondina X420		
194	Gasket	Nylon		
198	O-ring	NBR		
199	Union nut			
285	Dry-running sensors**			
285a	O-ring	NBR	1.4308	CF-8
285b	Set screw			
287	Level sensor			
287b	O-ring			
287c	Set screw			
532	Drying bag			
	Paint	Two-component epoxy		

\* Single-phase pumps only.

\*\* Explosion-proof pumps have two dry-running sensors.

\*\*\* DP pumps only.



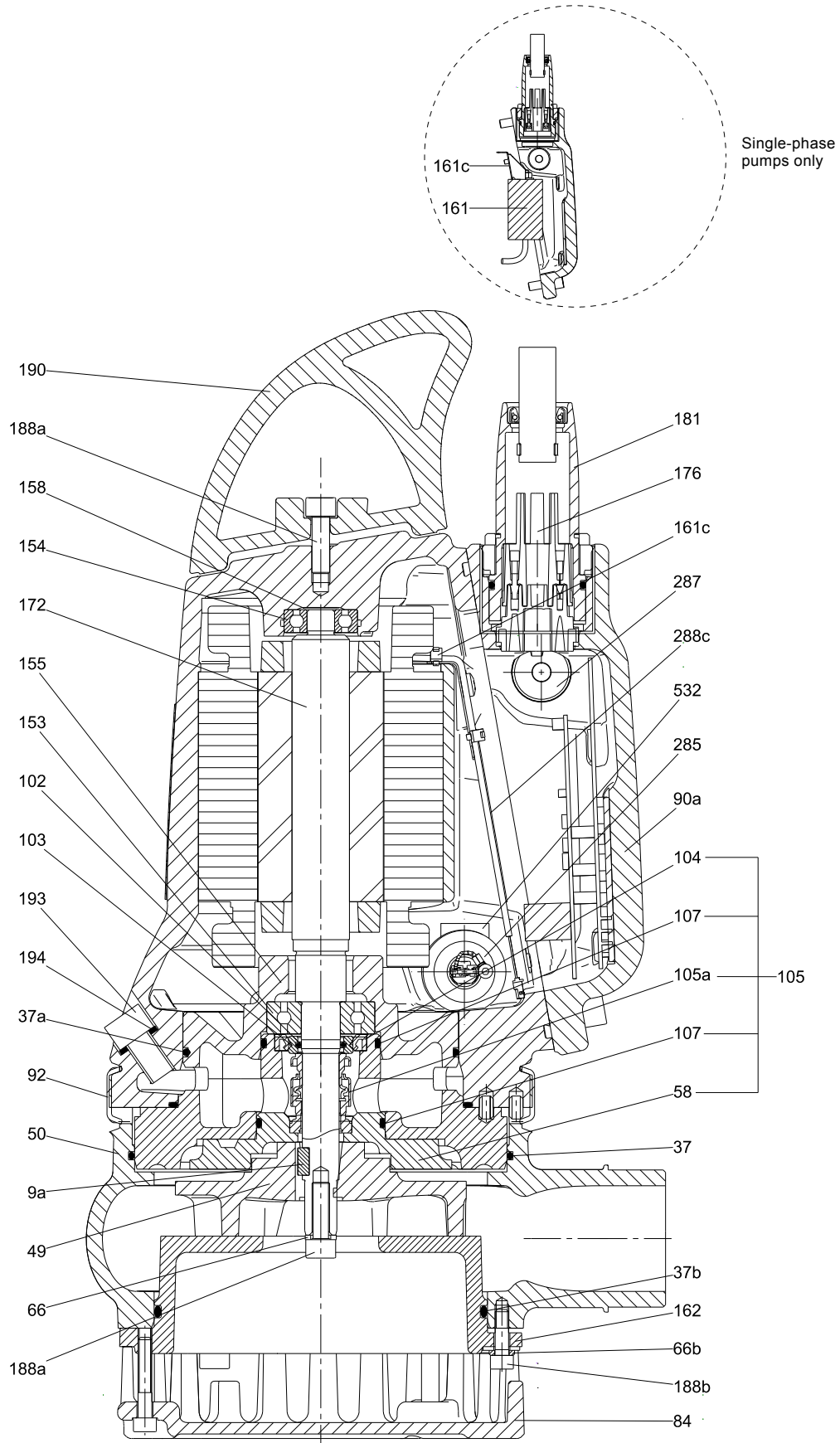


Fig. 14 Sectional drawing, DP10.50.09/15 AUTO<sub>ADAPT</sub>

TM06 6114 0716

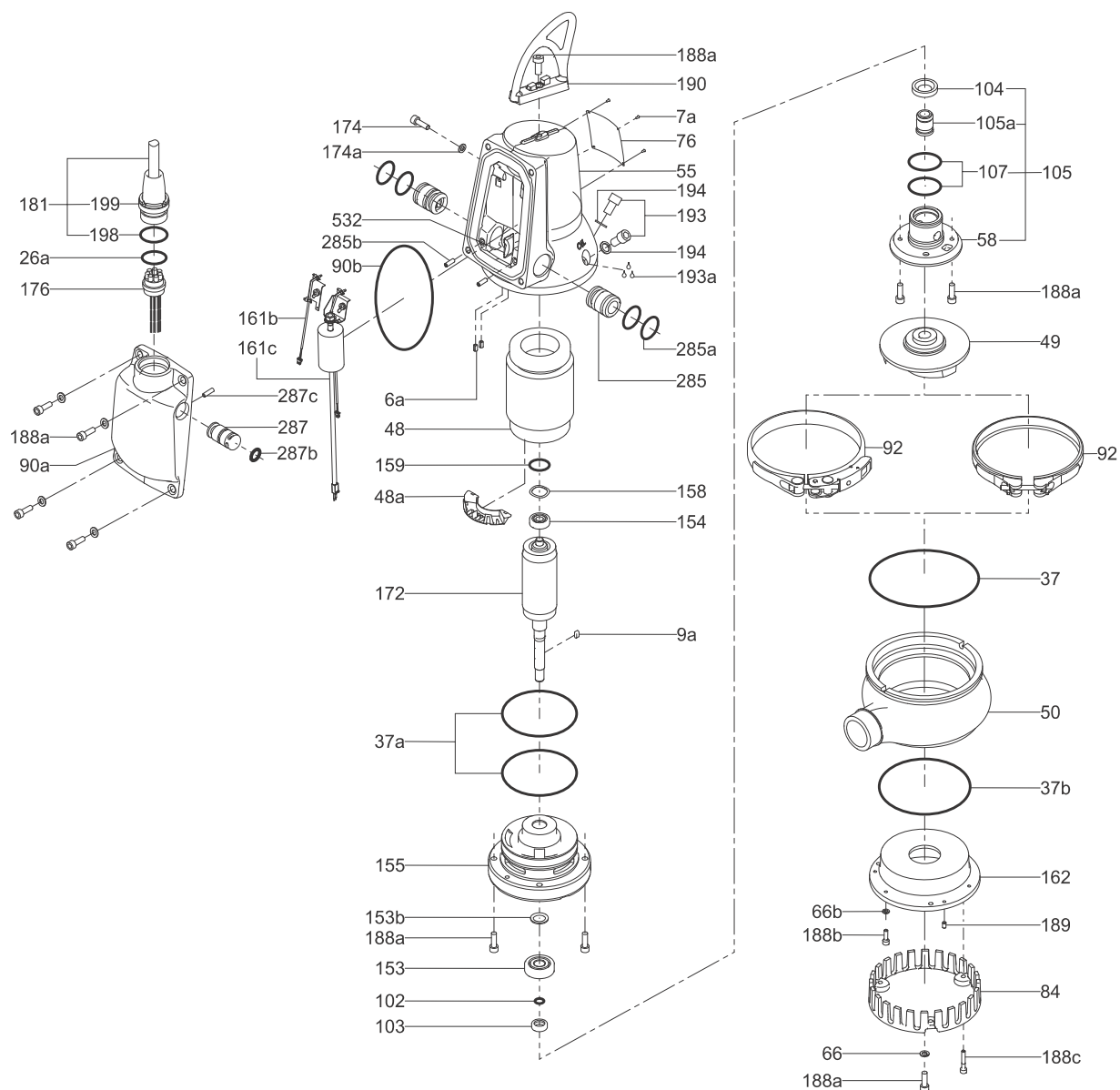


Fig. 15 Exploded view, DP10.50.09/15 AUTO<sub>ADAPT</sub>

TM06 5879 0316

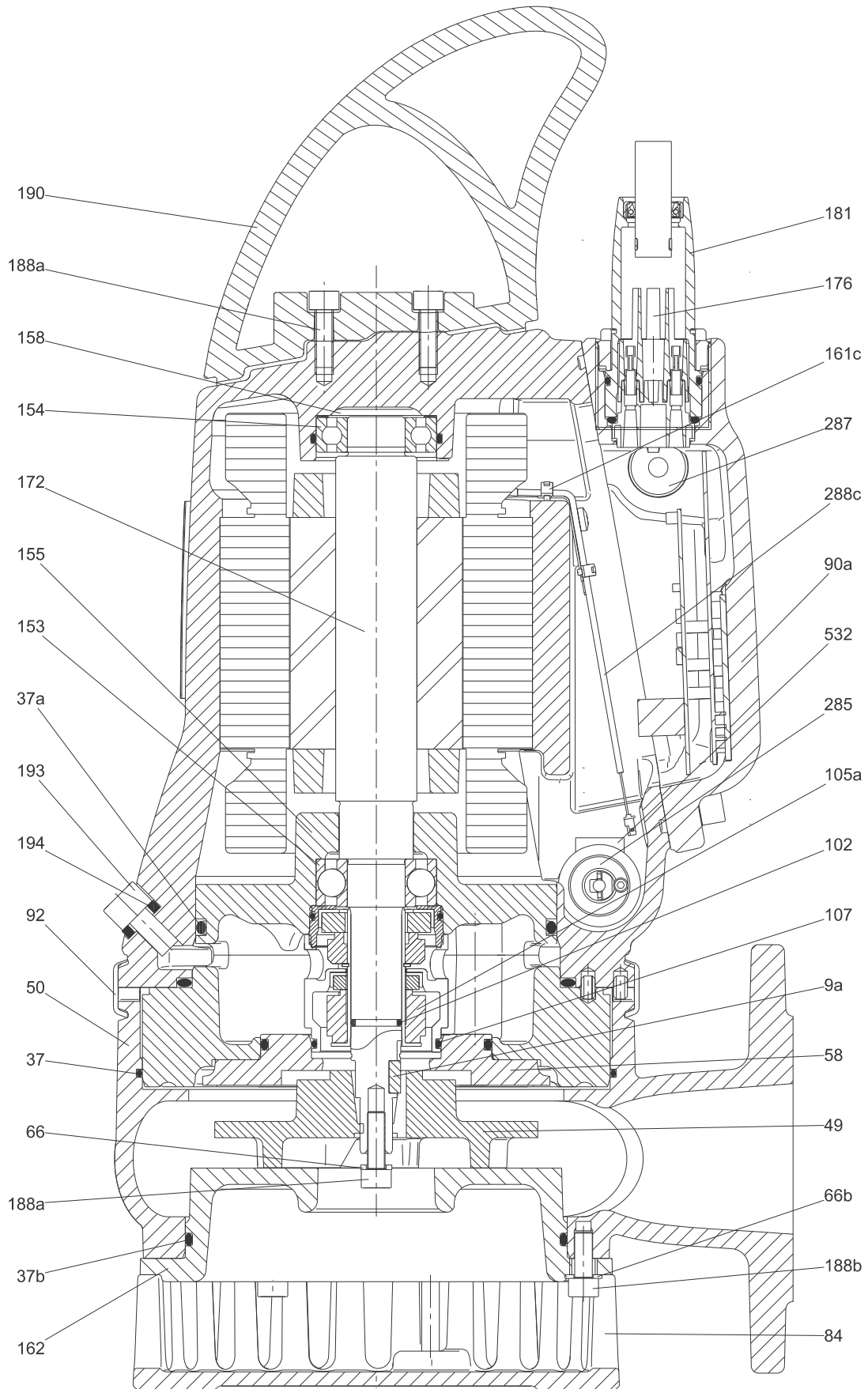


Fig. 16 Sectional drawing, DP10.65.26 AUTO<sub>ADAPT</sub>

TM06 6115 0716

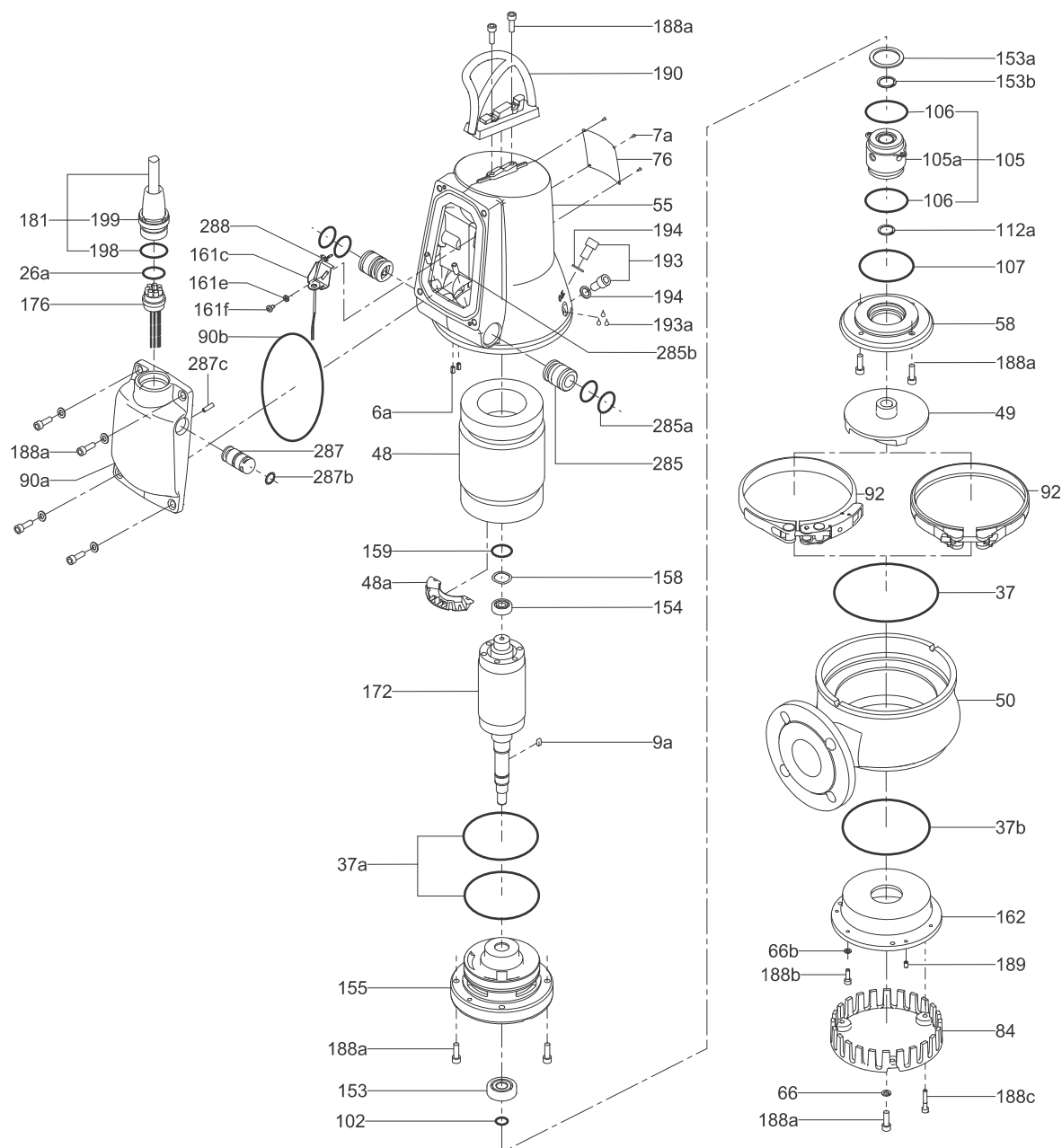


Fig. 17 Exploded view, DP10.65.26 AUTO<sub>ADAPT</sub>

TM06 5900 0316

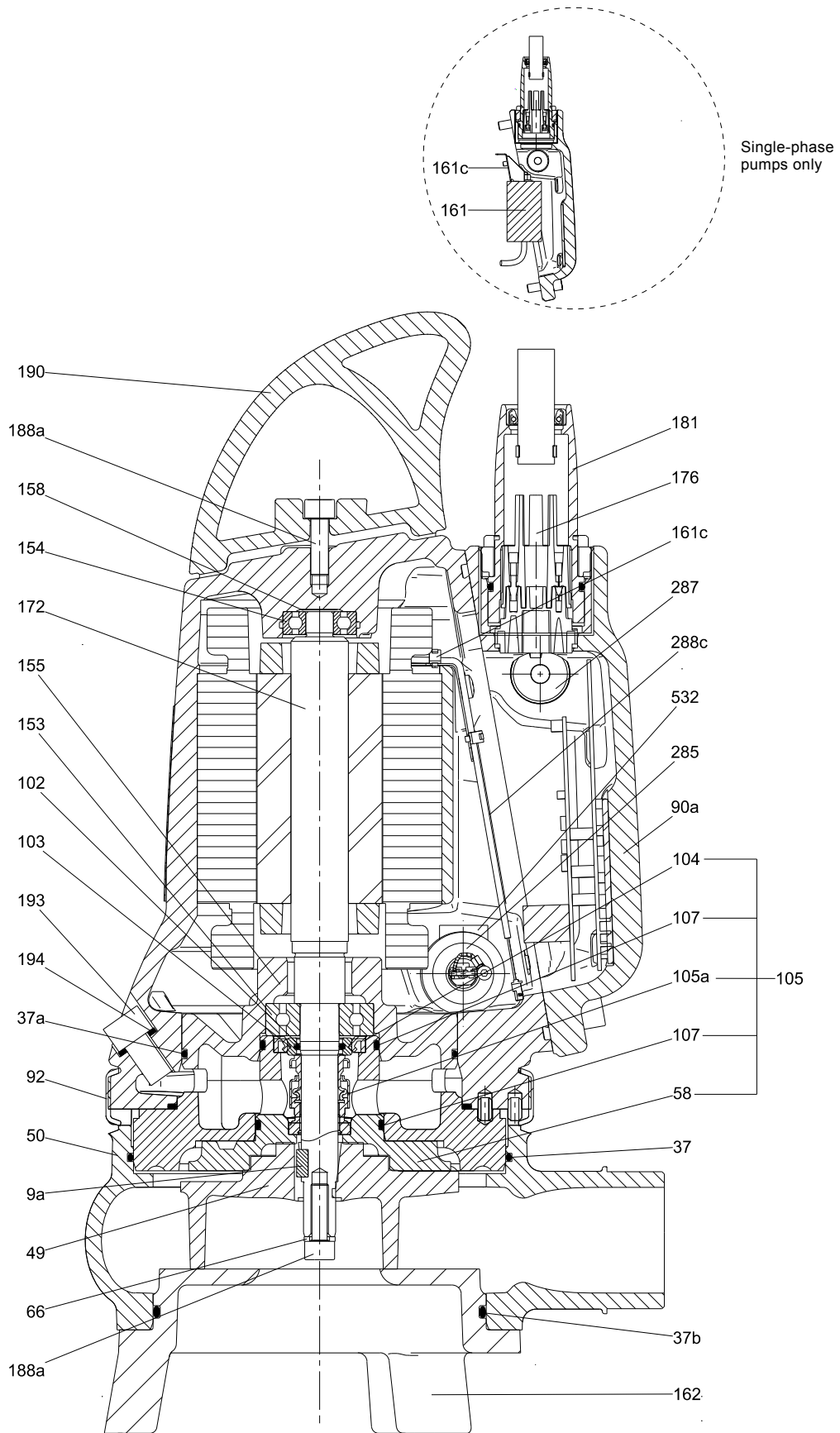


Fig. 18 Sectional drawing, EF AUTO<sub>ADAPT</sub>

TM06 6116 0716

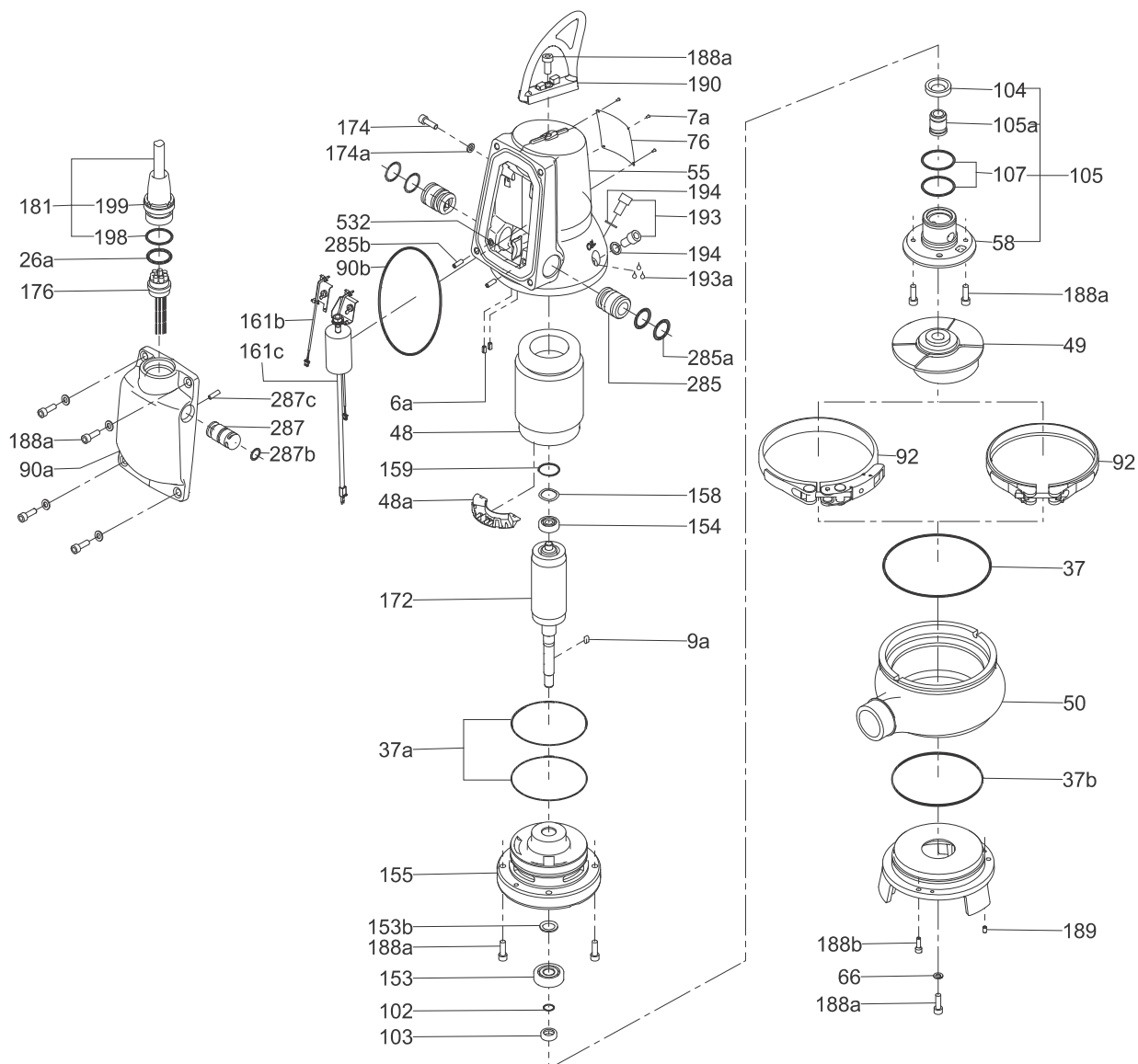


Fig. 19 Exploded view, EF AUTO<sub>ADAPT</sub>

TM06 5913 0316



## Material specification, SL1 and SLV, standard pumps

The position numbers in the table below refer to the sectional drawings and exploded views on the following pages.

Pos.	Description	Material	EN standard	AISI/ASTM
6a	Pin	Stainless steel		
7a	Rivet	Stainless steel	1.4301	304
9a	Key	Stainless steel		
26a	O-ring	NBR		
37	O-ring	NBR		
37a	O-rings	NBR		
37b	O-rings	NBR		
48	Stator			
48a	Terminal board			
49	Impeller	Cast iron	SL1 = EN-GJS-500-7 SLV = EN-GJS-400-15	
50	Pump housing	Cast iron	EN-GJL-250	
55	Stator housing	Cast iron	EN-JL-1030	
58	Shaft seal carrier	Cast iron	EN-JL-1030	
66	Locking ring	Stainless steel		
76	Nameplate	Stainless steel	1.4301	304
92	Clamp	Stainless steel	1.4301	304
102	O-ring	NBR		
103	Bush	Stainless steel	1.4057	431
104	Seal ring	Primary seal (0.9 to 1.5 kW): SiC/SiC Secondary seal (0.9 to 1.5 kW): lip seal, NBR		
105/105a	Shaft seal			
107	O-rings	NBR		
150a	Stator in housing complete			
153	Bearing (lower)	6204		
153b	Washer	Steel		
154	Bearing (upper)	6301		
155	Oil chamber	Cast iron		
158	Corrugated spring	Steel		
159	O-ring	NBR		
162	Wear plate*	Cast iron		
172	Rotor Shaft	Stainless steel	1.1181 1.4301	304
173	Screw	Steel		
173a	Washer	Steel		
176	Inner plug part	PET		
181	Outer plug part	CR rubber, cable LYNIFLEX	1.4308	
185	O-ring	NBR		
187	Screw	Steel		
188a	Screw	Stainless steel		CF-8
188b	Locking screw			
189	Adjusting screw			
190	Lifting bracket	Stainless steel	1.4308	
193	Oil screw	Stainless steel		CF-8
193a	Oil	Shell Ondina X420		
194	Gasket	Nylon		
198	O-ring	NBR		

\* SL1 pumps only.

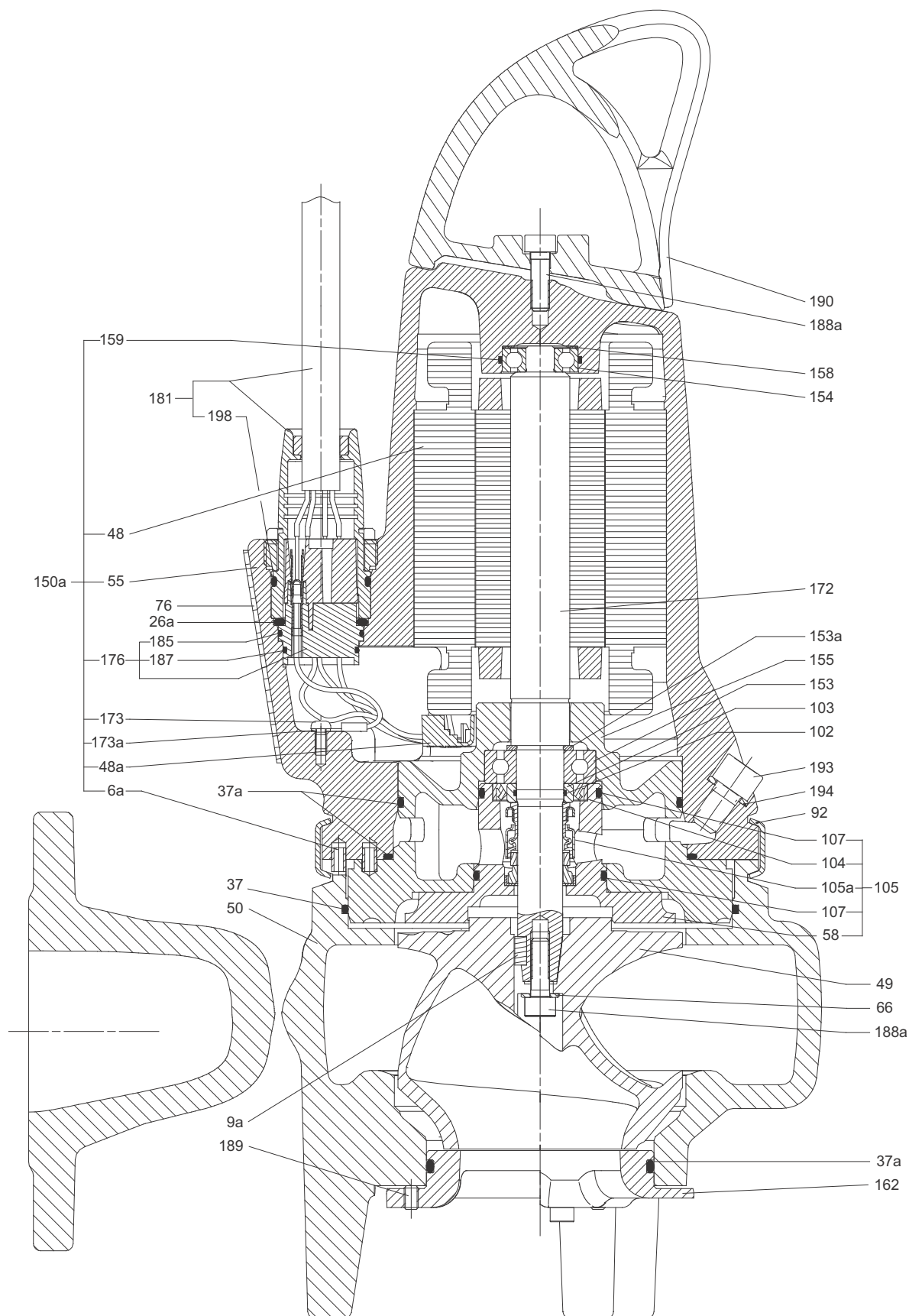


Fig. 20 Sectional drawing, SL1.50.65.09/11/15

TM06 6117 0716

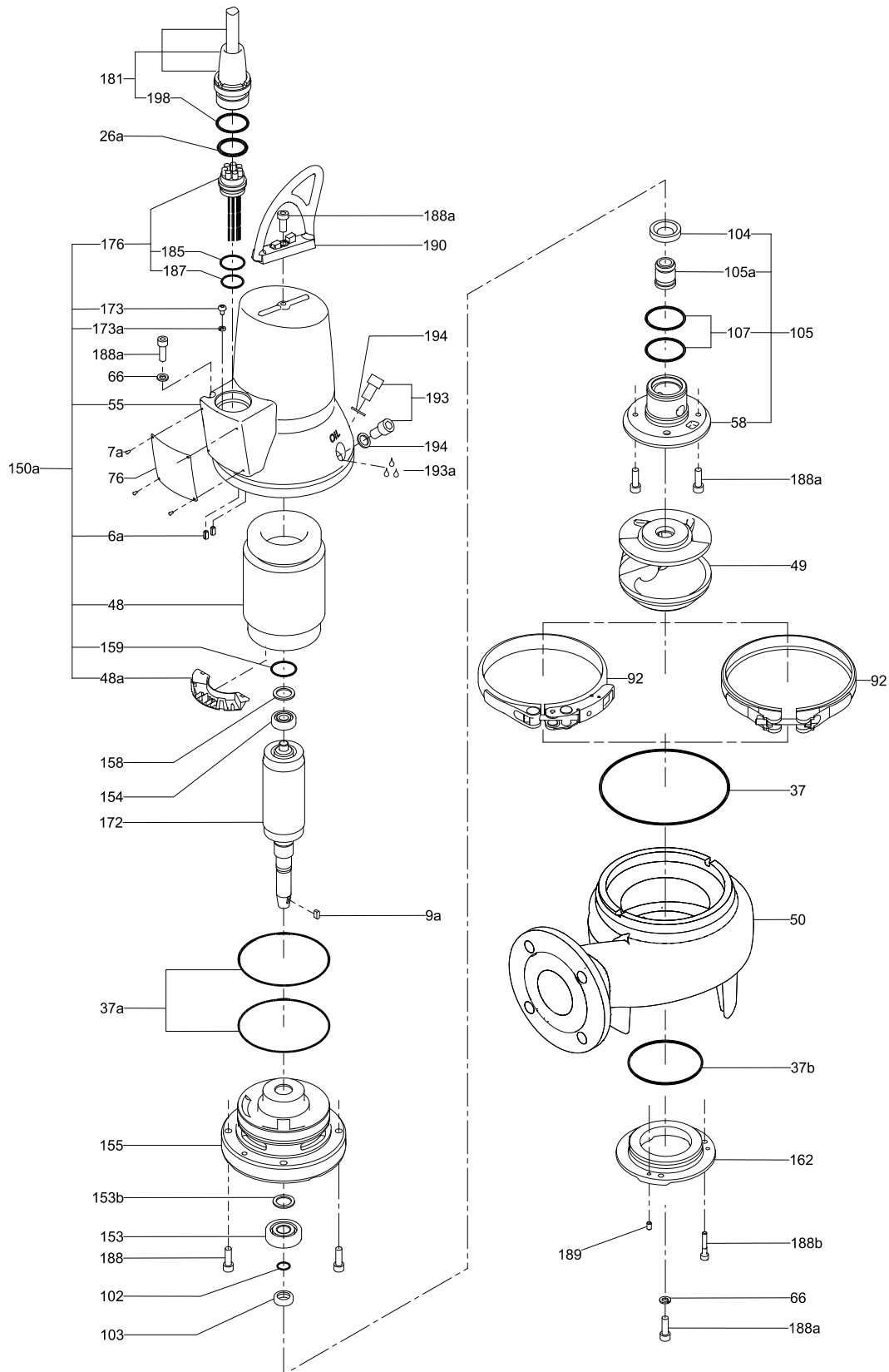
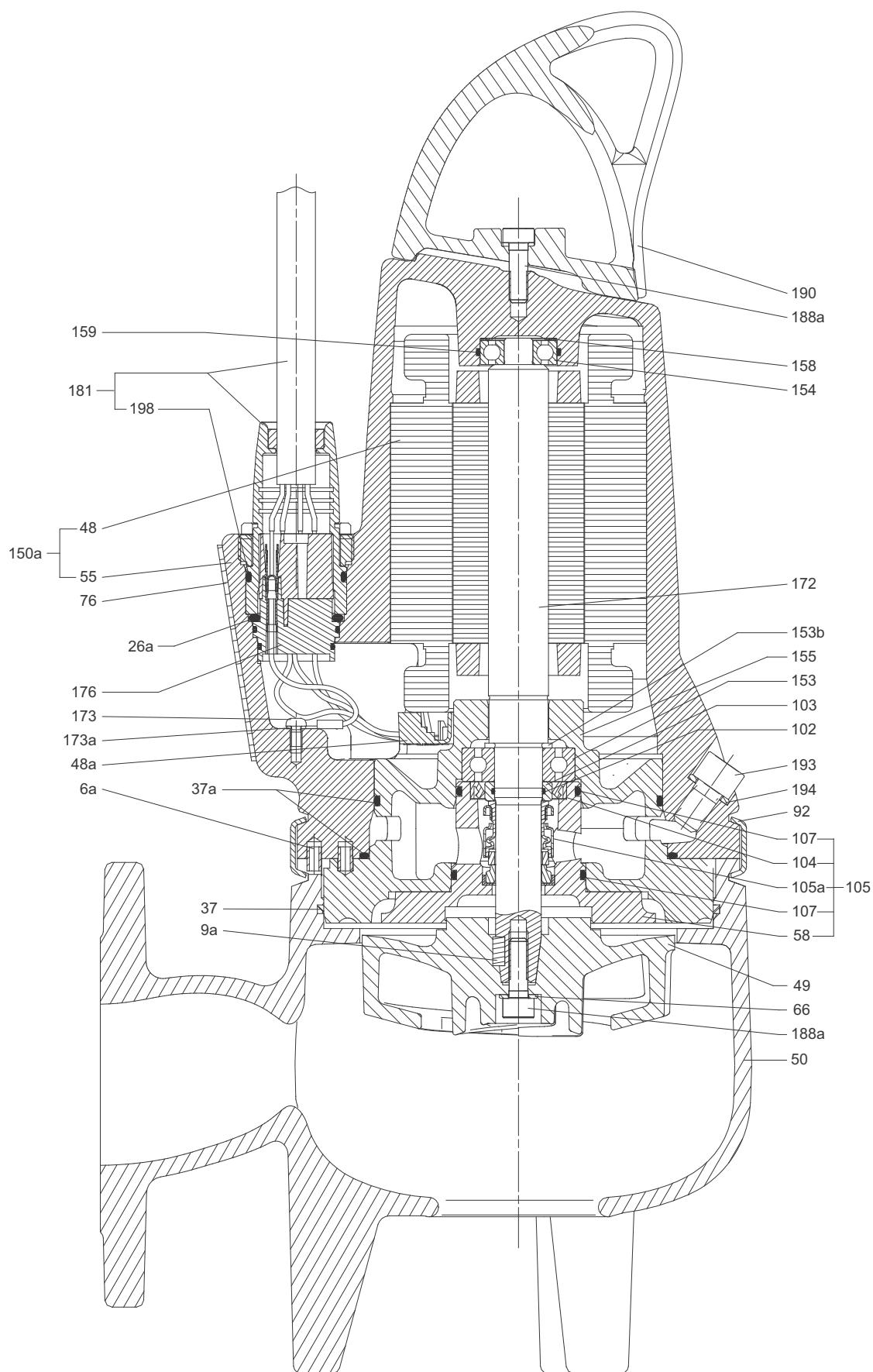


Fig. 21 Exploded view, SL1.50.65.09/11/15

TM06 5917 03 16



TM06 6118 0716

Fig. 22 Sectional drawing, SLV.65.65.09/11/15

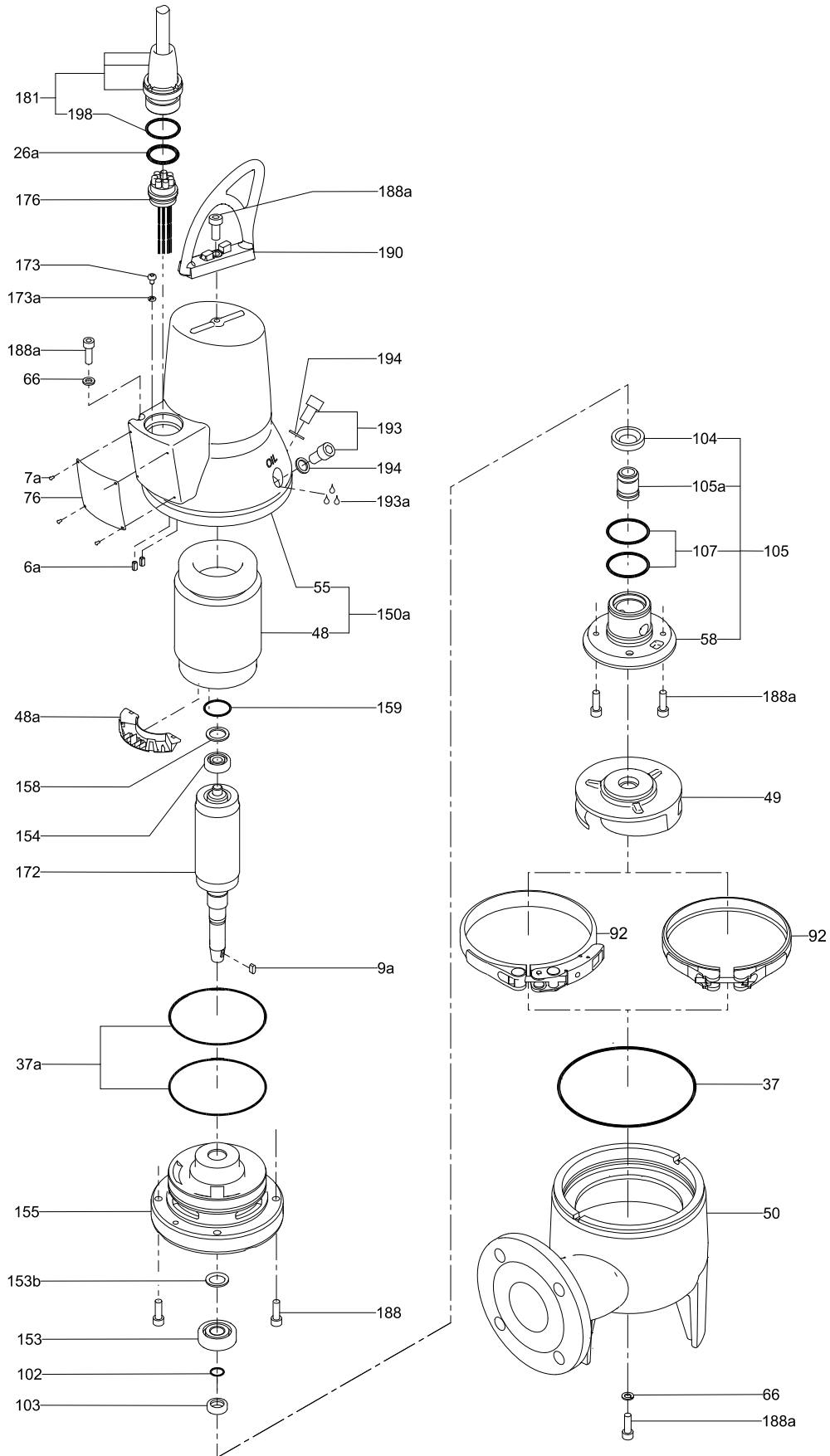


Fig. 23 Exploded view, SLV.65.65.09/11/15

TM06 5936 0316

## Material specification, SL1 and SLV, AUTO<sub>ADAPT</sub> pumps

The position numbers in the table below refer to the sectional drawings and exploded views on the following pages.

Pos.	Description	Material	EN standard	AISI/ASTM
6a	Pin	Stainless steel		
7a	Rivet	Stainless steel		
9a	Key	Stainless steel		
26a	O-ring			
37	O-ring			
37a	O-rings	NBR		
37b	O-ring			
48	Stator			
48a	Terminal board			
49	Impeller	Cast iron	SL1 = EN-GJS-500-7 SLV = EN-GJS-400-15	
50	Pump housing	Cast iron	EN-JL-1030	
55	Stator housing	Cast iron	EN-JL-1030	
58	Shaft seal carrier	Cast iron	EN-JL-1030	
66	Locking ring	Stainless steel		
76	Nameplate	Stainless steel	1.4301	304
90a	Electronic unit			
90b	O-ring			
92	Clamp	Stainless steel	1.4301	304
102	O-ring	NBR		
103	Bush	Stainless steel	1.4057	431
104	Seal ring	NBR		
105/105a	Shaft seal	Primary seal (0.9 to 1.5 kW): SiC/SiC Secondary seal (0.9 to 1.5 kW): lip seal, NBR		
107	O-rings	NBR		
153	Bearing (lower)	Up to and including 1.5 kW: 6204		
154	Bearing (upper)	Up to and including 1.5 kW: 6201		
155	Oil chamber			
158	Corrugated spring	Steel		
159	O-ring	NBR		
161b	Pt1000 sensor, with bracket			
161c	Run capacitor and Pt1000 sensor, with bracket*			
162	Wear plate***	Cast iron		
172	Rotor/shaft	Shaft part at rotor: steel Shaft end at hydraulics: stainless steel	1.1181 1.4301	304
173	Screw	Steel		
173a	Washer	Steel		
174	Earth screw			
174a	Washer			
176	Inner plug part	PET		
181	Outer plug part	CR rubber, cable LYNIFLEX	1.4308	CF-8
188a	Screw	Stainless steel		
188b	Locking screw	Steel		
190	Lifting bracket	Stainless steel	1.4308	CF-8
193	Oil screw	Stainless steel		
193a	Oil	Shell Ondina X420		
194	Gasket	Nylon		
198	O-ring	NBR		
199	Union nut			
285	Dry-running sensors**			
285a	O-ring	NBR	1.4308	CF-8
285b	Set screw			
287	Level sensor			
287a	Protection cap			
287b	O-ring			
287c	Set screw			
532	Drying bag			
	Paint	Two-component epoxy		

\* Single-phase pumps only.

\*\* Explosion-proof pumps have two dry-running sensors.

\*\*\* SL1 pumps only.

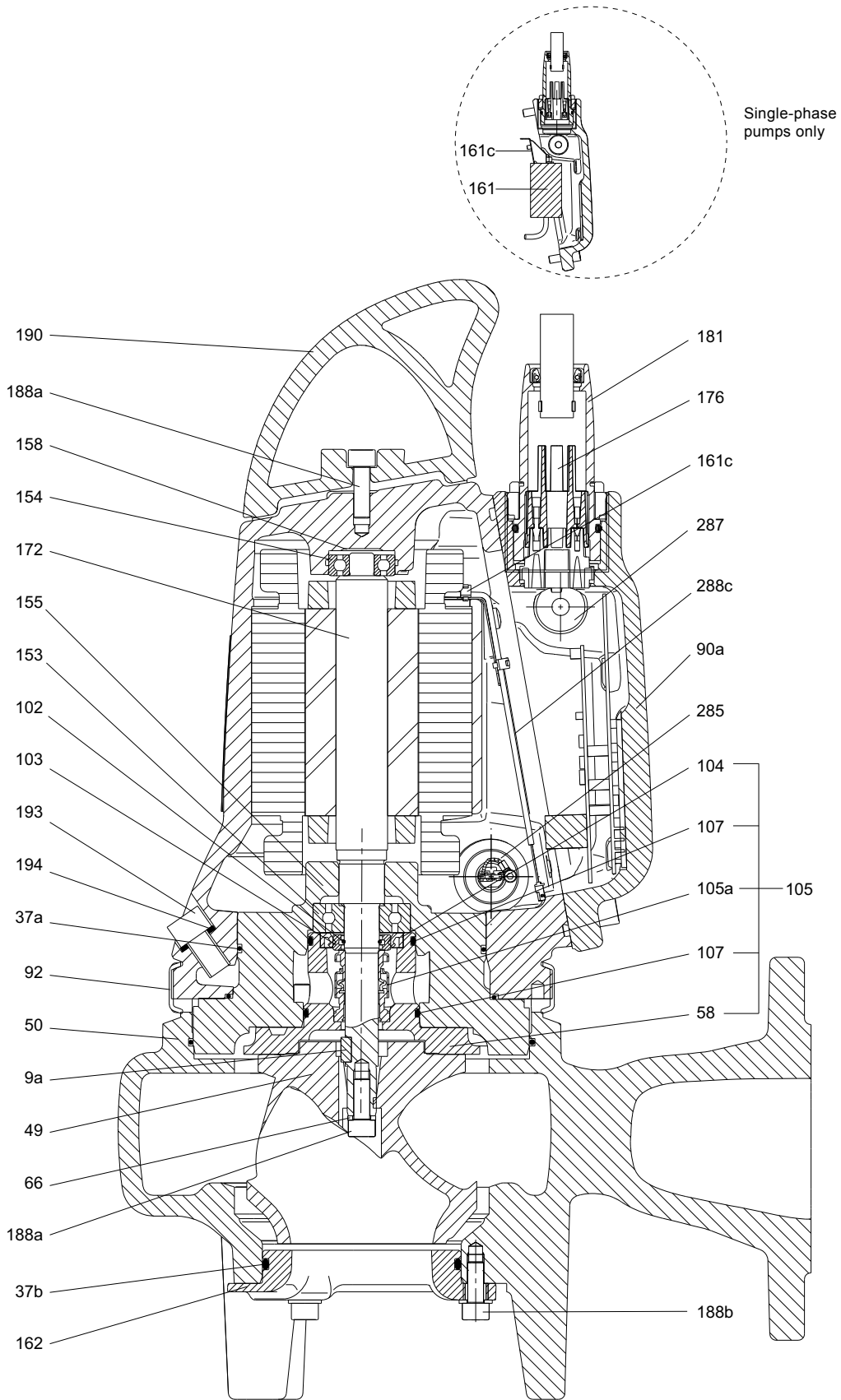


Fig. 24 Sectional drawing, SL1.50.65.09/11/15 AUTO<sub>ADAPT</sub>

TM06 6119 2417

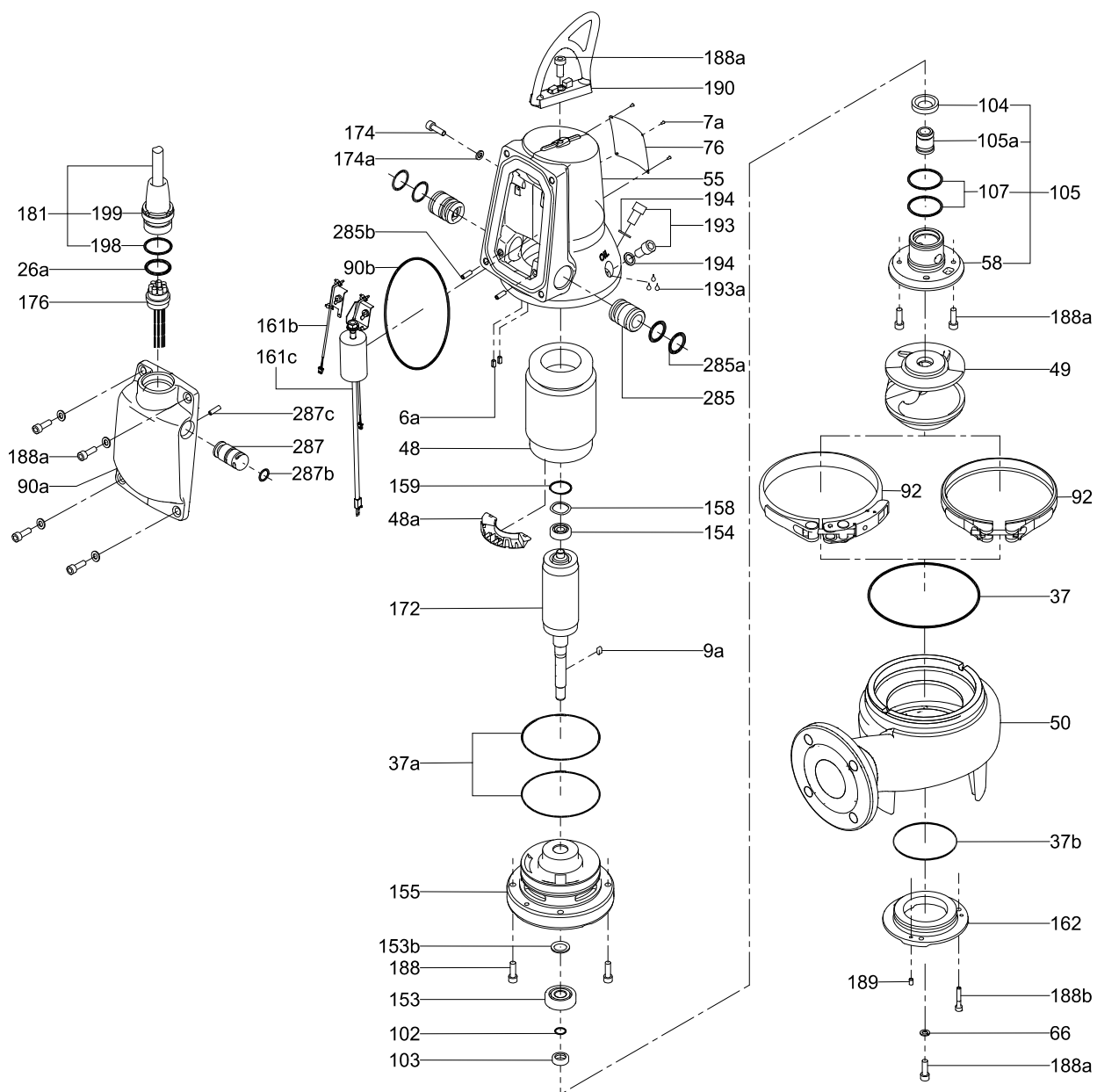


Fig. 25 Exploded view, SL1.50.65.09/11/15 AUTO<sub>ADAPT</sub>

TM06 5931 0316



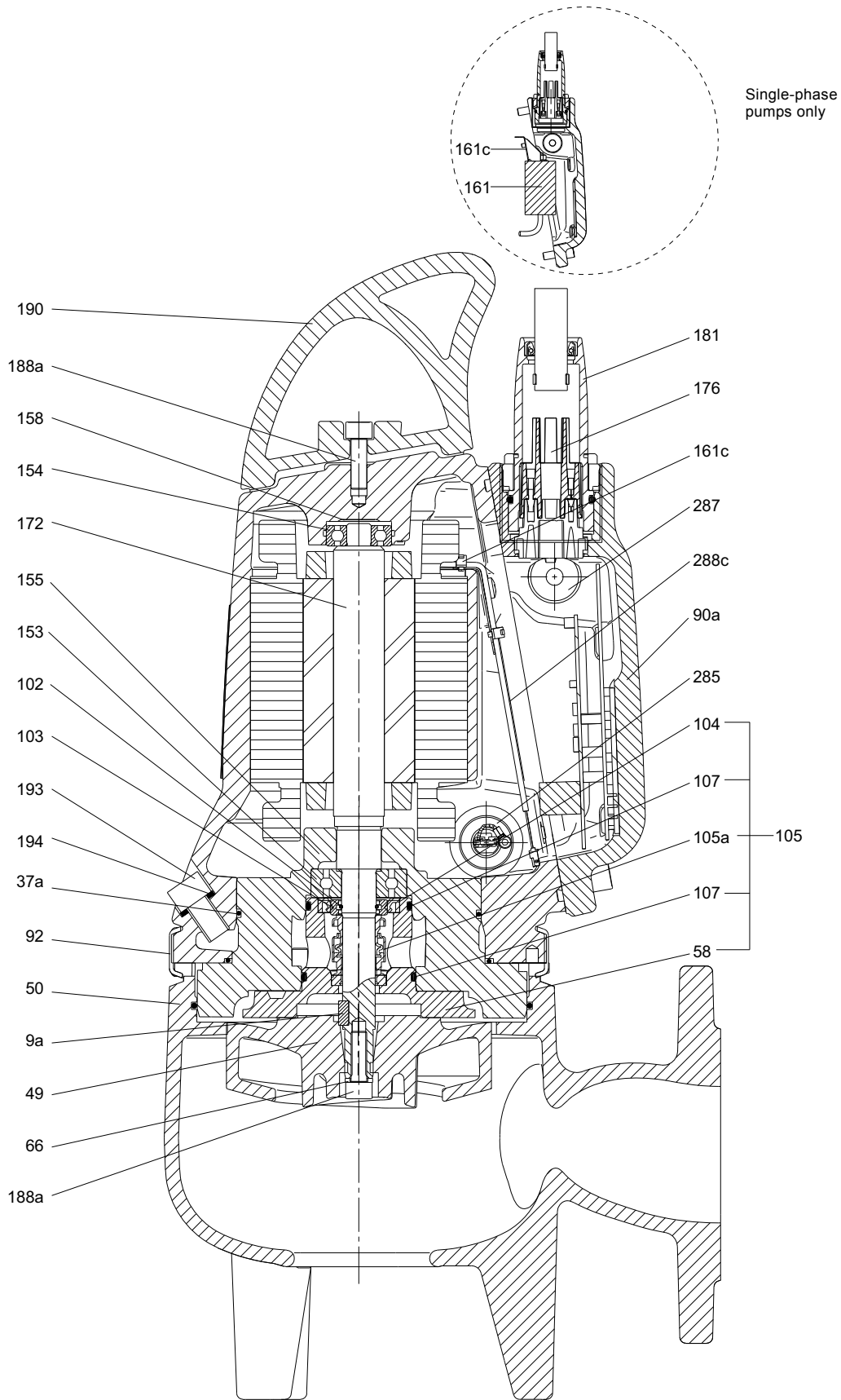


Fig. 26 Sectional drawing, SLV.65.65.09/11/15 AUTO<sub>ADAPT</sub>

TM06 6120 2417

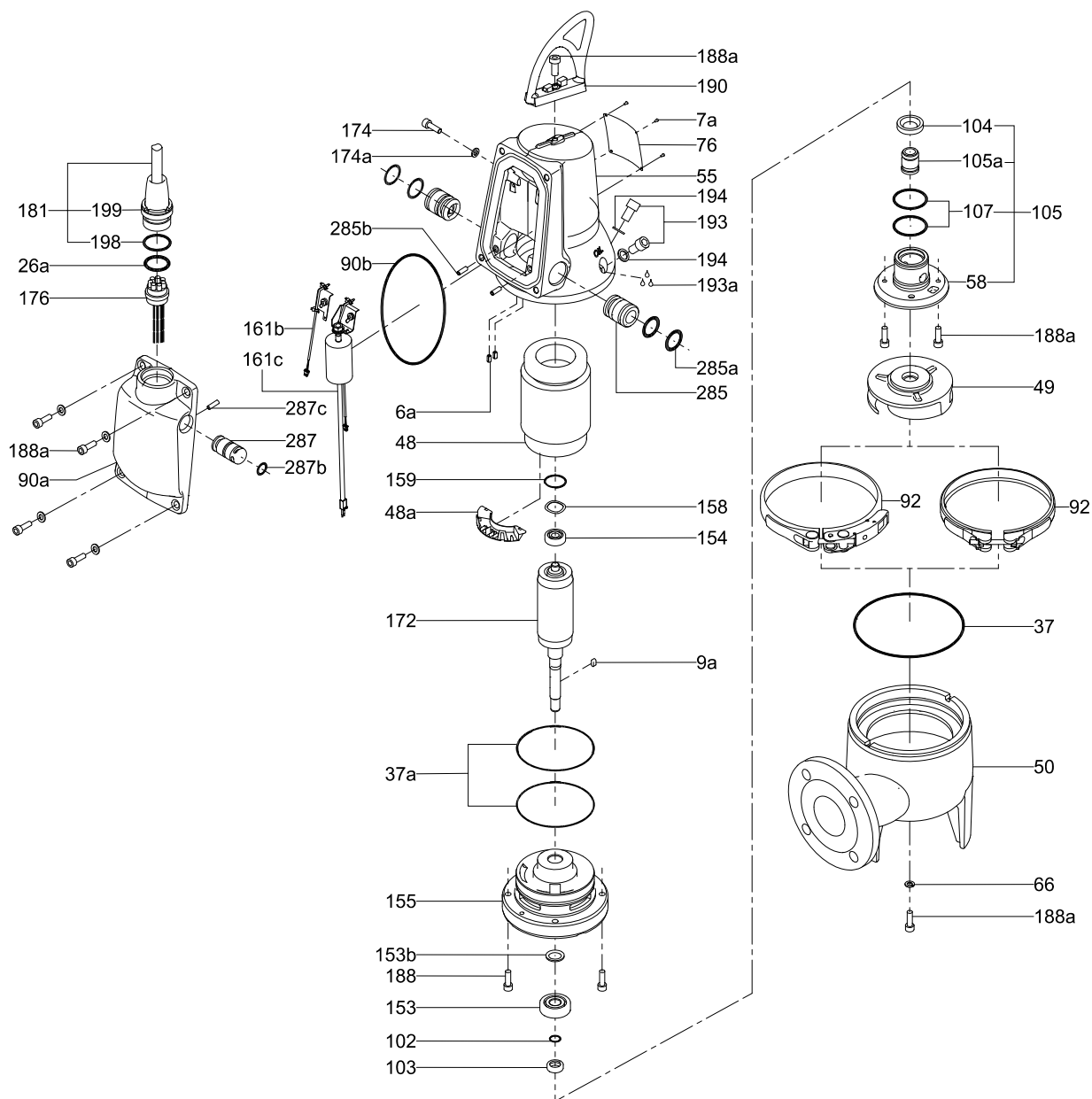


Fig. 27 Exploded view, SLV.65.65.09/11/15 AUTO<sub>ADAPT</sub>

TM06 5939 0316

## 8. Product description

### Features

#### Ball bearings

The ball bearings are greased for life.

Top bearings:

- Up to and including 1.5 kW:  
Single-row ball bearing 6301.  
AUTO<sub>ADAPT</sub> pumps up to and including 1.5 kW:  
Single-row ball bearing 6201.
- 2.6 kW and up:  
Single-row ball bearing 6205.

Bottom bearings:

- Up to and including 1.5 kW:  
Single-row ball bearing 6.
- 2.6 kW and up:  
Angular-contact ball bearing 3205.

#### Shaft seal

The DP, EF, SL1 and SLV pump ranges are available with two shaft seal variants. Both variants are fitted as cartridge seal units. The shaft seal separates the motor from the pumped liquid.

Pumps up to and including 1.5 kW have a silicon carbide/silicon carbide (SiC/SiC) mechanical shaft seal as primary seal and a lip seal as secondary seal. In connection with service, the mechanical shaft seal and the lip seal are supplied as one unit ready for fitting.

Pumps of 2.6 kW and up have a double seal consisting of a SiC/SiC mechanical shaft seal as primary seal and a carbon/aluminium oxide mechanical shaft seal as secondary seal.

#### Motor

The motor is a watertight, totally encapsulated motor.

Insulation class: F (155 °C).

Temperature class: F (105 K).

Enclosure class: IP68.

For motor protection and sensors, see section *Sensors*.

#### Built-in protection

The motor incorporates an electronic unit which protects the motor in various situations.

In case of overload, the built-in overload protection will stop the pump for five minutes. After that period, the pump is ready to restart if the start conditions are fulfilled.

To reset the pump, switch off the power supply for one minute.

The motor is protected in the following situations:

- dry running
- voltage surges, up to 6000 V, in areas with high lightning intensity. External lightning protection is required.
- overvoltage
- undervoltage
- overload
- overtemperature.

### Power supply cables

#### Standard cable

Cable type	Outer cable diameter [mm]	Bending radius	
		Fixed	Free
Lyniflex 4 G 1.5 mm <sup>2</sup> + 3 x 1 mm <sup>2</sup>	15.5 ± 0.5	60	90

#### Screened cable

Cable type	Outer cable diameter [mm]	Bending radius	
		Fixed	Free
3G3GC3G-F3x1AiC+4 G 2.5 mm <sup>2</sup>	17.5 ± 0.5	85	170

As standard, the cables are 10 metres long. Other cable lengths are available on request. See section *Variants*, page 18.

The number and dimension of cables depend on the motor size.

#### Cable entry

The stainless-steel plug is fastened with a union nut. The nut and O-rings provide sealing against ingress of the liquid.

The plug is filled with a special material that is cast into the plug around the leads of the cable. This prevents the ingress of water into the motor through the cable in case of cable breakage or adverse handling in connection with installation or service.

### Sensors

#### DP, EF, SL1 and SLV, standard pumps

As standard, the pumps have two thermal switches incorporated in the motor windings to protect the motor against overheating.

#### DP, EF, SL1 and SLV, AUTO<sub>ADAPT</sub> pumps

As standard, the pumps incorporate the following:

- one analog absolute-pressure transmitter
- one dry-running sensor.  
Explosion-proof versions have two dry-running sensors.  
The dry-running sensor(s) are used for indicating the stop level in the first pump cycle and to prevent dry running.  
In standard versions, the dry-running sensor can be overruled by an optional CIU unit if there is a risk of a floating layer.
- all pumps have two sets of thermal switches incorporated in the stator windings to protect the motor against overheating.
- two Pt1000 sensors for analog measurement
- built-in motor protection I<sup>2</sup> (t) as extra safety.

## Operating conditions

The pumps are designed for intermittent operation (S3). When completely submerged, the pumps can also operate continuously (S1).

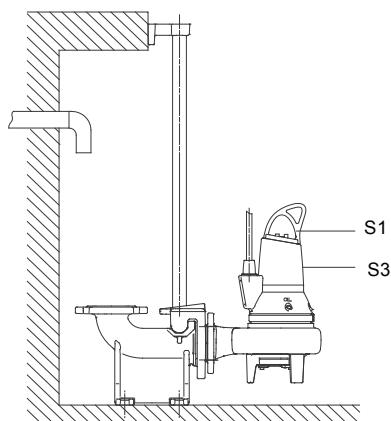


Fig. 28 Operation levels

- **S3, intermittent operation:**

The S3 is a series of identical duty cycles TC, each with a constant load for a period, followed by a rest period. Thermal equilibrium is not reached during the cycle. See fig. 29.

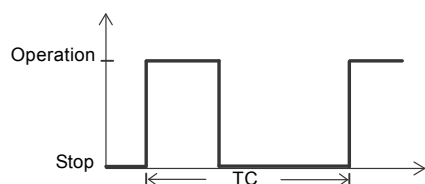


Fig. 29 S3 operation

- **S1, continuous operation:**

In this operating mode, the pump can operate continuously without having to be stopped for cooling. See fig. 30. Being completely submerged, the pump is sufficiently cooled by the surrounding liquid. See fig. 28.

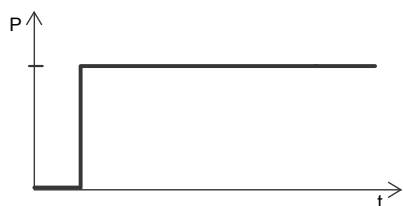


Fig. 30 S1 operation

## Pumped liquids

pH value: 4 to 10.

Liquid temperature: 0-40 °C.

When pumping liquids with a density and/or a kinematic viscosity higher than that of water, use motors with correspondingly higher outputs.

For short periods (max. 3 minutes), temperatures up to 60 °C are permissible (non-Ex versions only).

### Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Machinery Directive (2006/42/EC).

## Motor range

Output power [kW]	Number of poles
0.6	2
0.9	2
1.1	2
1.5	2
2.6	2

## Frequency converter operation

This section applies to DP, EF, SL1 and SLV, standard pumps only.

**Note:** The DP, EF, SL1 and SLV, AUTO<sub>ADAPT</sub> pumps must not be used with a frequency converter.

In principle, all three-phase pumps, except the AUTO<sub>ADAPT</sub> versions, can be connected to a frequency converter.

However, frequency converter operation will often expose the motor insulation system to a heavier load and cause the motor to be more noisy than usual due to eddy currents caused by voltage peaks.

In addition, large motors driven via a frequency converter will be loaded by bearing currents.

For more information, see the installation and operating instructions for the relevant frequency converter on [www.grundfos.com](http://www.grundfos.com) (Grundfos Product Center).

TM06 5919 0316

TM04 4527 1509

TM04 5228 1509

## Approvals


### Approval standards


The standard version of DP and EF pumps have been tested by VDE and approved by LGA (notified body under the Construction Products Directive) according to EN 12050-2 as specified on the pump nameplate.


The standard versions of SL1 and SLV pumps are tested by VDE and approved by LGA (notified body under the Construction Products Directive) according to EN 12050-1 and EN 12050-2 as specified on the pump nameplate.

### Explanation to Ex approval

The explosion-proof versions have been approved by DEKRA according to the ATEX directive.

The explosion protection classification of the pump is CE 0344  Ex II 2 G, Ex d IIB T4.

The DP/EF and SL1/SLV AUTO<sub>ADAPT</sub> explosion-proof versions have been approved by DEKRA according to the ATEX directive. The explosion protection classification of the pump is CE 0344  II 2 G Ex b c d ib IIB T4 Gb.

Directive/standard	Code	Description
ATEX	CE 0344	= CE mark of conformity according to the ATEX directive 2014/34/EU. 0344 is the number of the notified body which has certified the quality system for ATEX.
		= Explosion protection mark.
	II	= Equipment group according to the ATEX directive, defining the requirements applicable to the equipment in this group.
	2	= Equipment category according to the ATEX directive, defining the requirements applicable to the equipment in this category.
	G	= Explosive atmospheres caused by gases, vapours or mists.
Harmonised European standard	Ex	= The equipment conforms to the harmonised European standard.
	b	= Control of ignition sources according to EN 13463-6.
	c	= Constructional safety according to EN 13463-5 and EN 13463-1.
	d	= Flame-proof enclosure according to EN 60079-1.
	ib	= Intrinsic safety according to EN60079-11.
	IIB	= Classification of gases according to EN 60079-0. Gas group B includes gas group A.
	T4	= Maximum surface temperature is 135 °C according to EN 60079-0.
	Gb	= Equipment protection level (IEC).

For Australia the DP/EF and SL1/SLV explosion-proof versions are approved as EX nC II T3 according to IEC 60079-15:1987, certificate nr. IECEx KEM 06.0028X (corresponding to AS 2380.9).

Standard	Code	Description
IEC 60079-15	Ex	= Area classification according to AS 2430.1.
	n	= Non-sparking according to AS 2380.9:1991, section 3 (IEC 60079-15).
	C	= The environment is adequately protected against sparking components.
	II	= Suitable for use in explosive atmospheres (not mines).
	T3	= Maximum surface temperature is 200 °C.

For IEC countries, such as Australia and others, the DP/EF and SL1/SLV AUTO<sub>ADAPT</sub> explosion-proof versions have been approved by DEKRA (certificate no.: IECEx 11.0026X) according to IEC 60079-0:2007, IEC 60079-1:2007 and IEC 60079-11:2006. The explosion protection classification of the AUTO<sub>ADAPT</sub> pumps is Ex d ib IIB T4 Gb.

Standard	Code	Description
IEC 60079-0, IEC 60079-1 and IEC 60079-11	Ex	= The equipment conforms to the IEC.
	d	= Flame-proof enclosure according to IEC 60079-1:2007.
	ib	= Intrinsic safety according to EN60079-11.
	IIB	= Classification of gases according to IEC 60079-0. Gas group B includes gas group A.
	T4	= Maximum surface temperature is 135 °C according to IEC 60079-0.
	Gb	= Equipment protection level (IEC).

Wiring diagrams

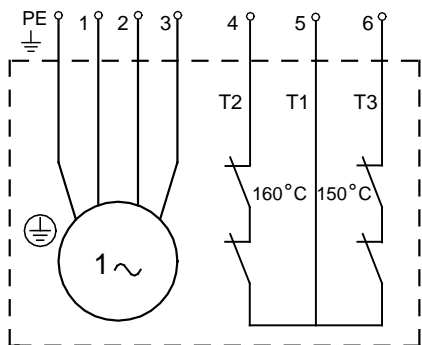
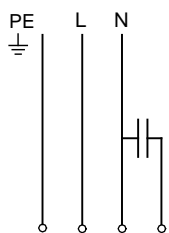


Fig. 31 Wiring diagram for single-phase pumps

TM02 5587 4302

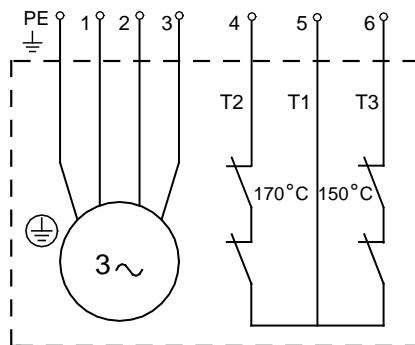
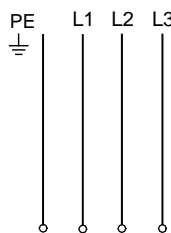


Fig. 33 Wiring diagram for three-phase pumps

TM02 5588 4302

Cs, starting capacitor		Cr, run capacitor	
[μF]	[V]	[μF]	[V]
150	230	30	450

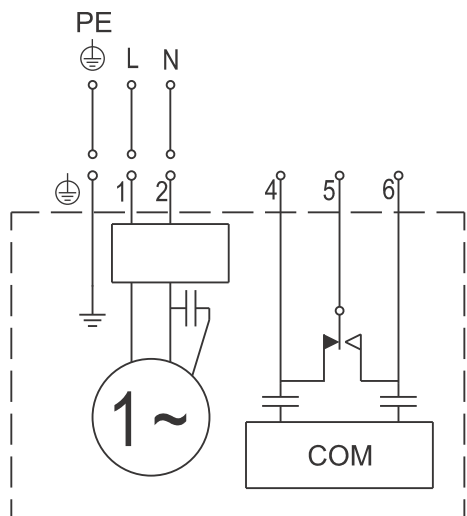


Fig. 32 Wiring diagram for single-phase AUTO<sub>ADAPT</sub> pumps

TM04 4297 1209

Cr, run capacitor	
[μF]	[V]
30	450

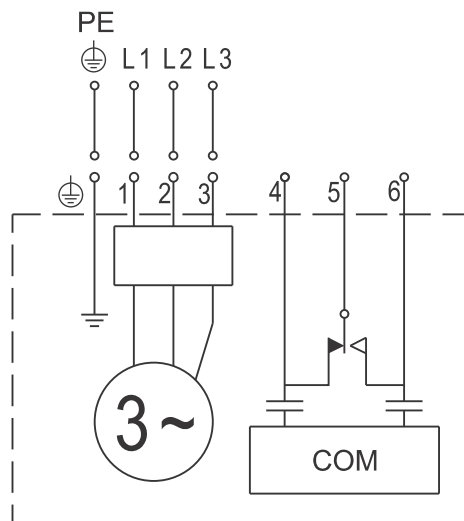


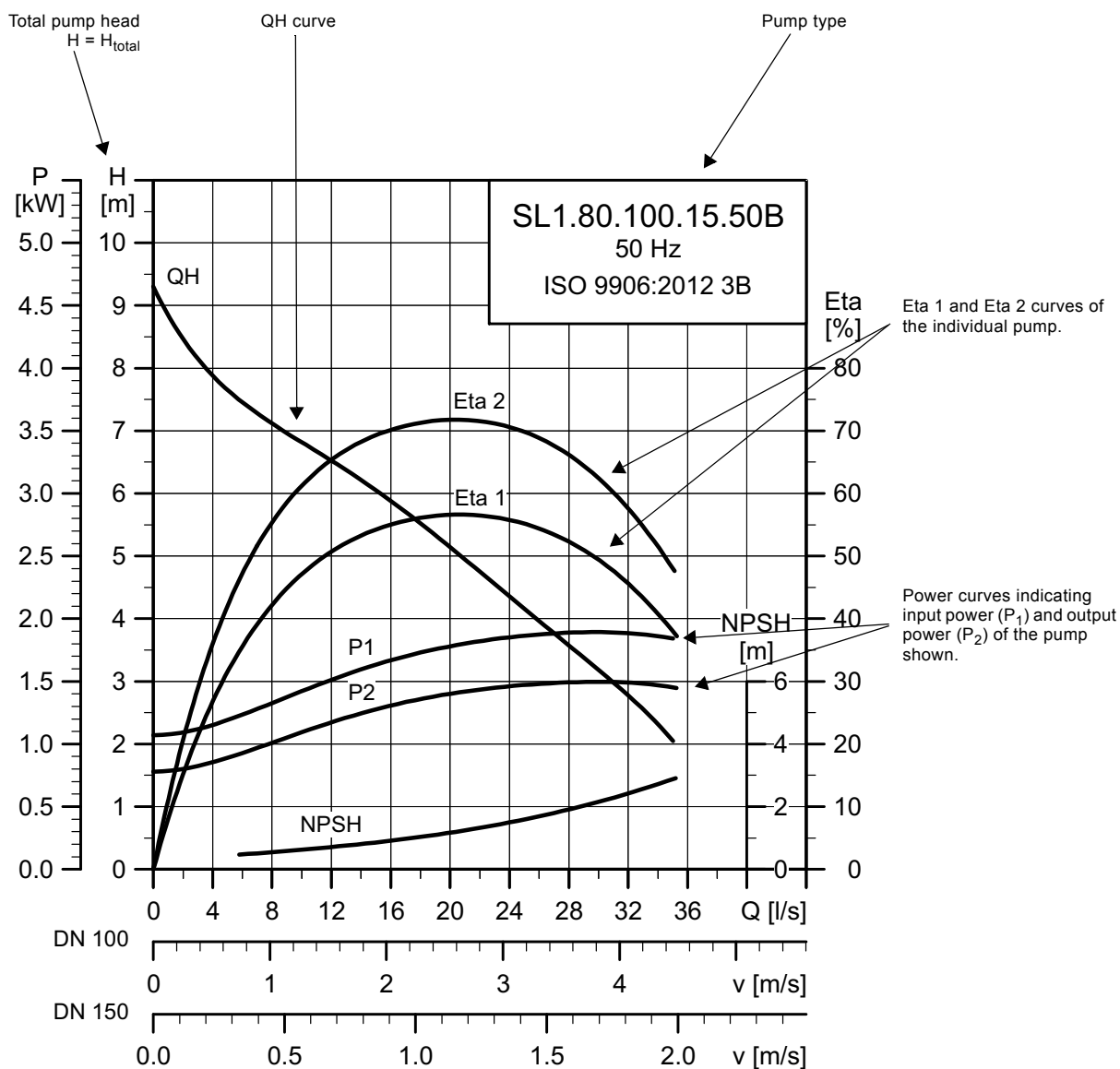
Fig. 34 Wiring diagram for three-phase AUTO<sub>ADAPT</sub> pumps

TM04 4298 1209

## 9. Curve charts

How to read the performance curves

The curves on the following pages apply to DP, EF, SL1 and SLV, standard and AUTO<sub>ADAPT</sub> pumps as well as the explosion-proof versions.



TM04 3460 4608

**Note:** The pumps are tested according to ISO 9906:2012 grade 3B tolerance. Testing equipment and measuring instruments are designed and calibrated according to the standards mentioned. The pumps are approved according to tolerances for entire curves, specified in grade 3B.

## Curve conditions

The guidelines below apply to the curves on pages 49 to 69.

- Tolerances according to ISO 9906:2012, grade 3B.
- The curves apply to the pumping of airless water at a temperature of +20 °C and a kinematic viscosity of 1 mm<sup>2</sup>/s (1 cSt).
- The Eta curves show the efficiency of the pump.
  - Eta 1 is the overall efficiency of the pump ( $P_{\text{hyd}}/P_1$ ).
  - Eta 2 is the hydraulic efficiency of the pump ( $P_{\text{hyd}}/P_2$ ).

$P_2$ : Pump input power.

$P_1$ : Motor input power.

$P_{\text{hyd}}$ : Power applied by the pump to the liquid.

- In the case of other densities than 1000 kg/m<sup>3</sup>, the outlet pressure is proportional to the density.
- When pumping liquids with a density higher than 1000 kg/m<sup>3</sup>, motors with correspondingly higher outputs must be used.

### Calculation of total head

The total pump head consists of the height difference between the measuring points + the differential head + the dynamic head.

$$H_{\text{total}} = H_{\text{geo}} + H_{\text{stat}} + H_{\text{dyn}}$$

$H_{\text{geo}}$ : Height difference between measuring points.

$H_{\text{stat}}$ : Differential head across the pump.

$H_{\text{dyn}}$ : Calculated values based on the velocity of the pumped liquid on the inlet and outlet sides of the pump.

## Performance tests

The requested duty point of every pump is tested according to ISO 9906:2012, grade 3B, and without certification.

In the case of pumps ordered on the basis of impeller diameter only (no requested duty point), the pump will be tested at a duty point which is 2/3 of the maximum flow of the published performance curve which is related to the ordered impeller diameter (according to ISO 9906:2012, grade 3B).

If the customer requires either more points on the curve to be checked or certain minimum performances or certificates, individual measurements must be made, and a certificate can be ordered.

## Certificates

Certificates have to be confirmed for every order and are available on request. See section *List of variants*, page 18.

## Witness test

It is possible for the customer to witness the testing procedure according to ISO 9906:2012.

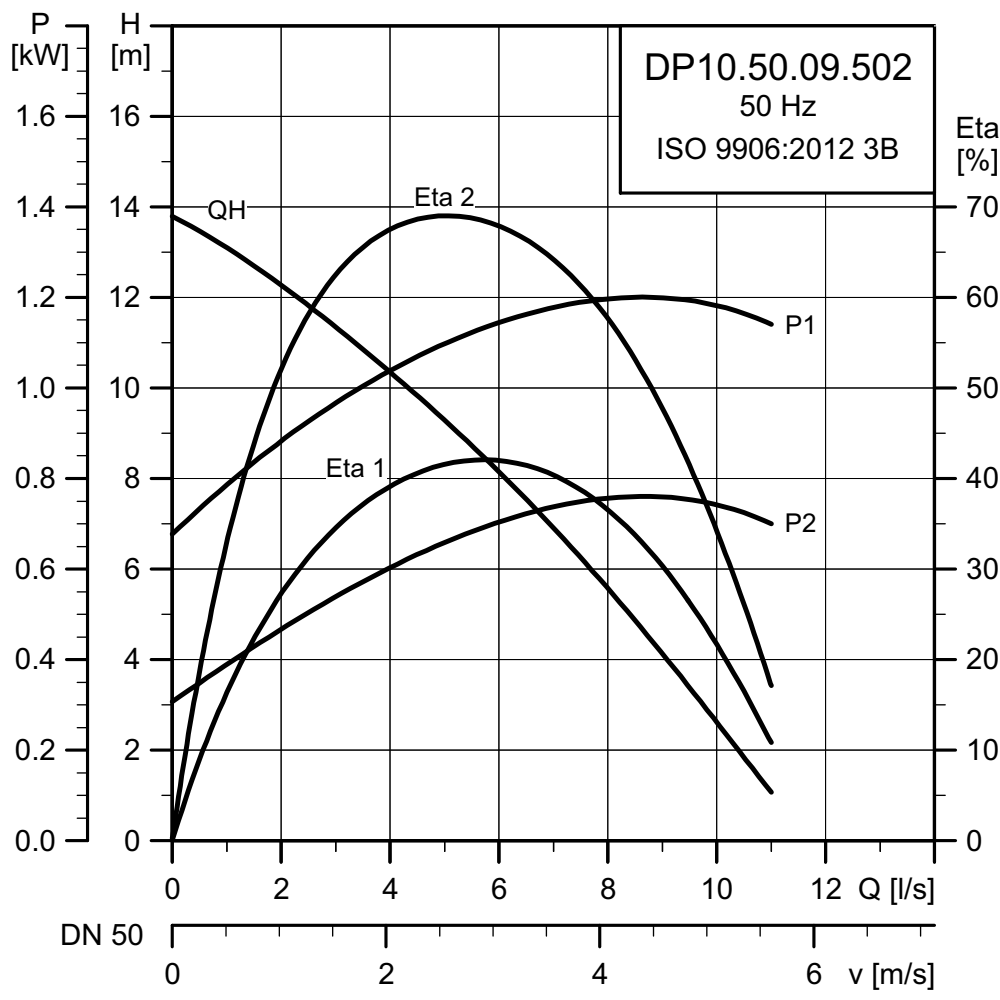
The witness test is not a certificate and will not result in a written statement from Grundfos. The witness test itself is the only guarantee that everything is carried out as prescribed in the testing procedure.

If the customer wants to witness the test of the pump performance, this request must be stated on the order.



# 10. Performance curves and technical data

DP 10.50.09.(A)/(E).(Ex).2.1.502



TMD2 7463 1810

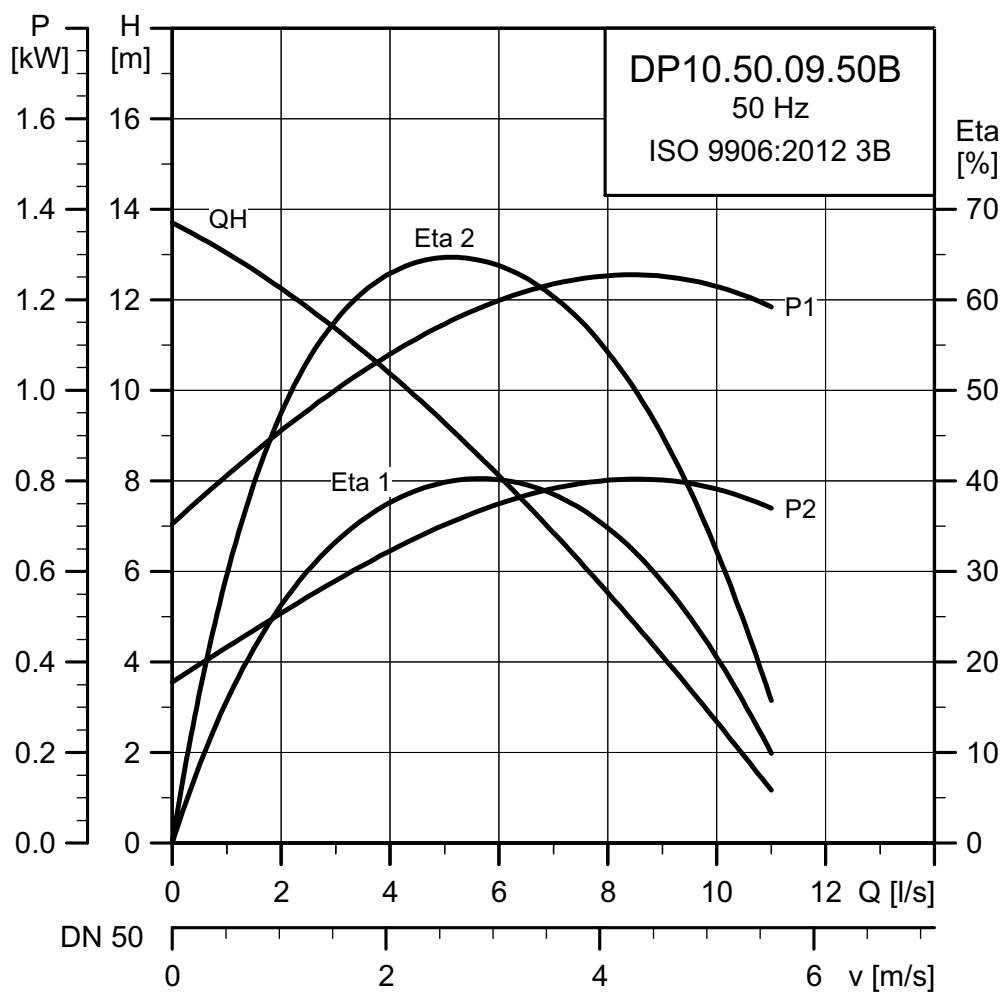
## Electrical data

Voltage	P1	P2	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor	I <sub>N</sub>	I <sub>start</sub>	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
[V]	[kW]	[kW]				[μF]			1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.3	0.9	2	2870	DOL	30	6.1	38	0.55	0.63	0.67	0.86	0.92	0.96	0.0033	7

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class
Semi-open	10	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

## DP 10.50.09.(A)/(E).(Ex).2.50B



TM02 7462 1810

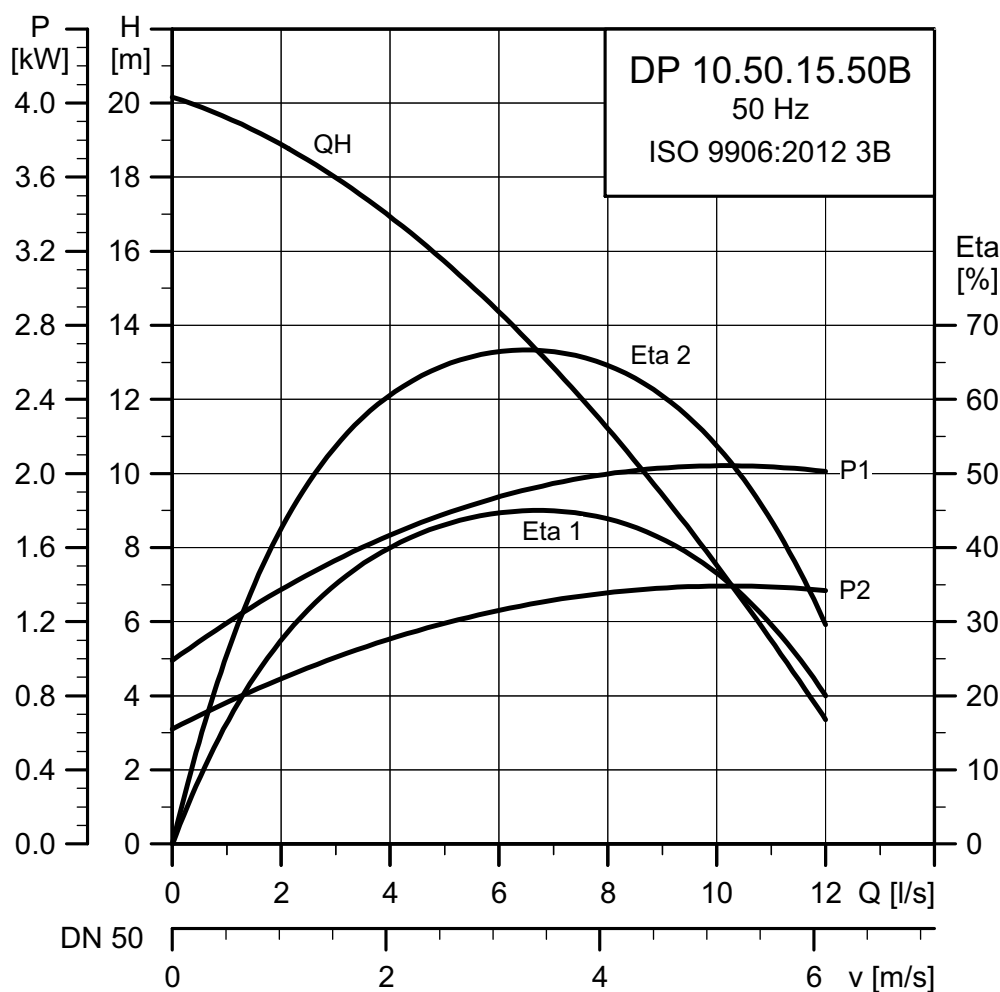
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	$n$ $\text{min}^{-1}$	Starting method	$I_N$		$\eta_{\text{motor}}$ [%]				$\text{Cos } \varphi$			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						$I_N$ [A]	$I_{\text{start}}$ [A]	1/2	3/4	1/1	1/2	3/4	1/1			
3 x 400-415	1.38	0.9	2	2870	DOL	2.8	21	58	61	65	0.58	0.68	0.76	0.0033	12	

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## DP 10.50.15.(A)/(E).(Ex).2.50B



TM02 7461 1810

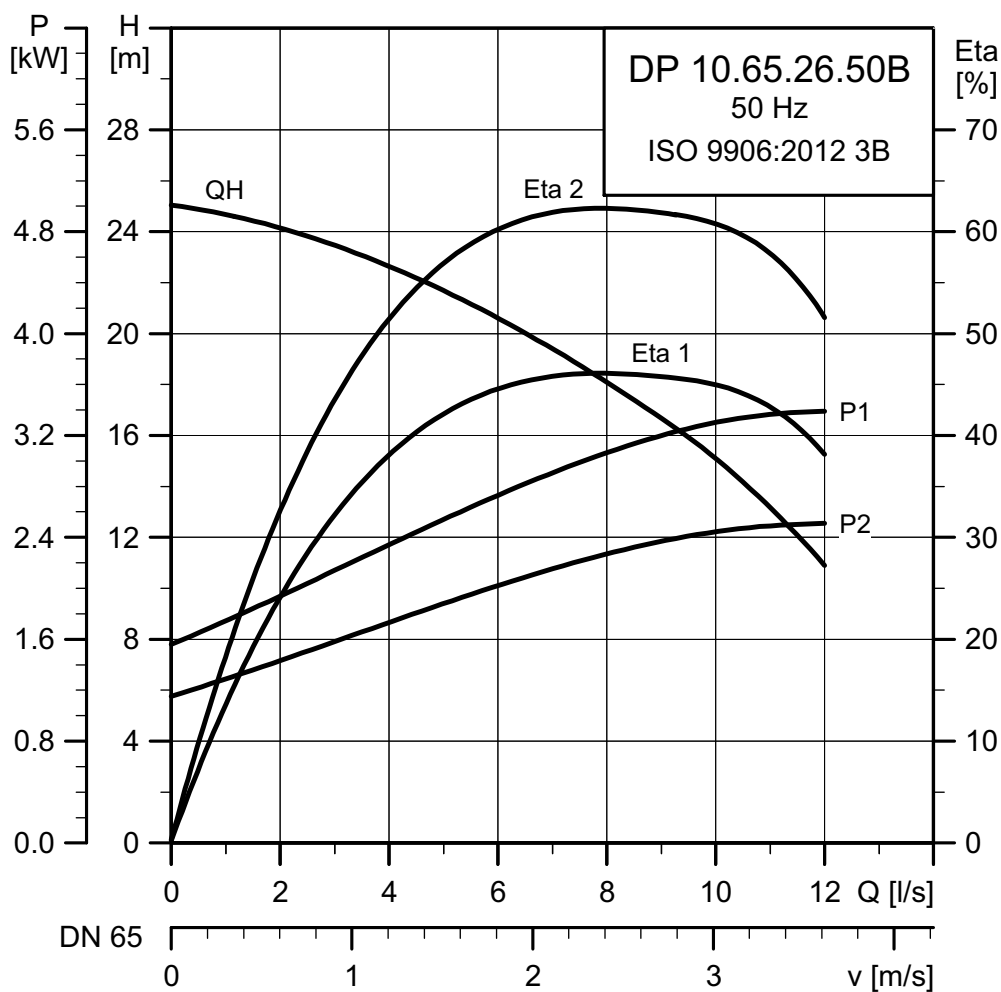
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	$\text{min}^{-1}$	Starting method	$I_N$		$\eta_{\text{motor}} [\%]$				$\text{Cos } \varphi$			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						$I_N$ [A]	$I_{\text{start}}$ [A]	1/2	3/4	1/1	1/2	3/4	1/1			
3 x 400-415	2.2	1.5	2	2720	DOL	3.8	21	63	68	67	0.71	0.81	0.88	0.0036	12	

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## DP 10.65.26.(A)/(E).(Ex).2.50B



TM02 7464 1810

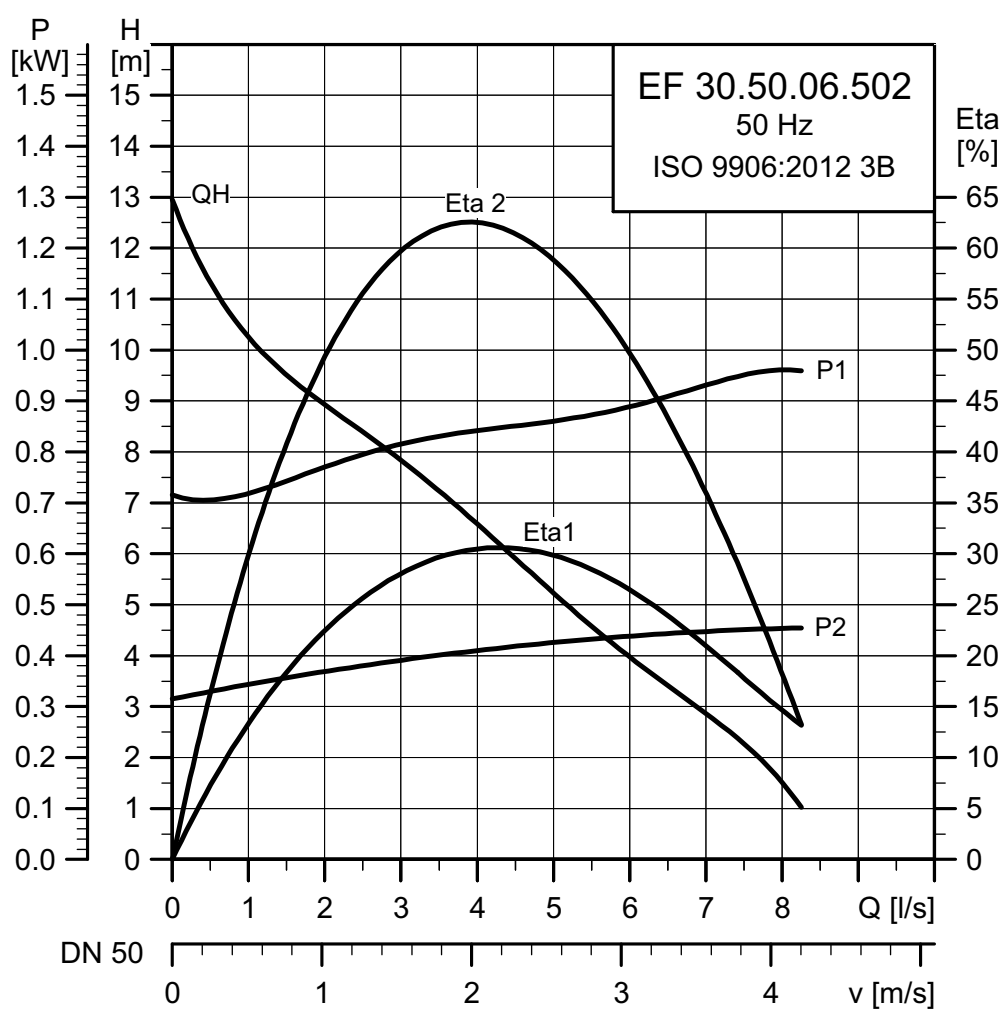
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 400-415	3.5	2.6	2	2870	DOL	5.8	33	74	75	74	0.68	0.81	0.87	0.007	24				

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

EF 30.50.06.(A)/(E).(Ex).2.1.502



TM02 7469 1810

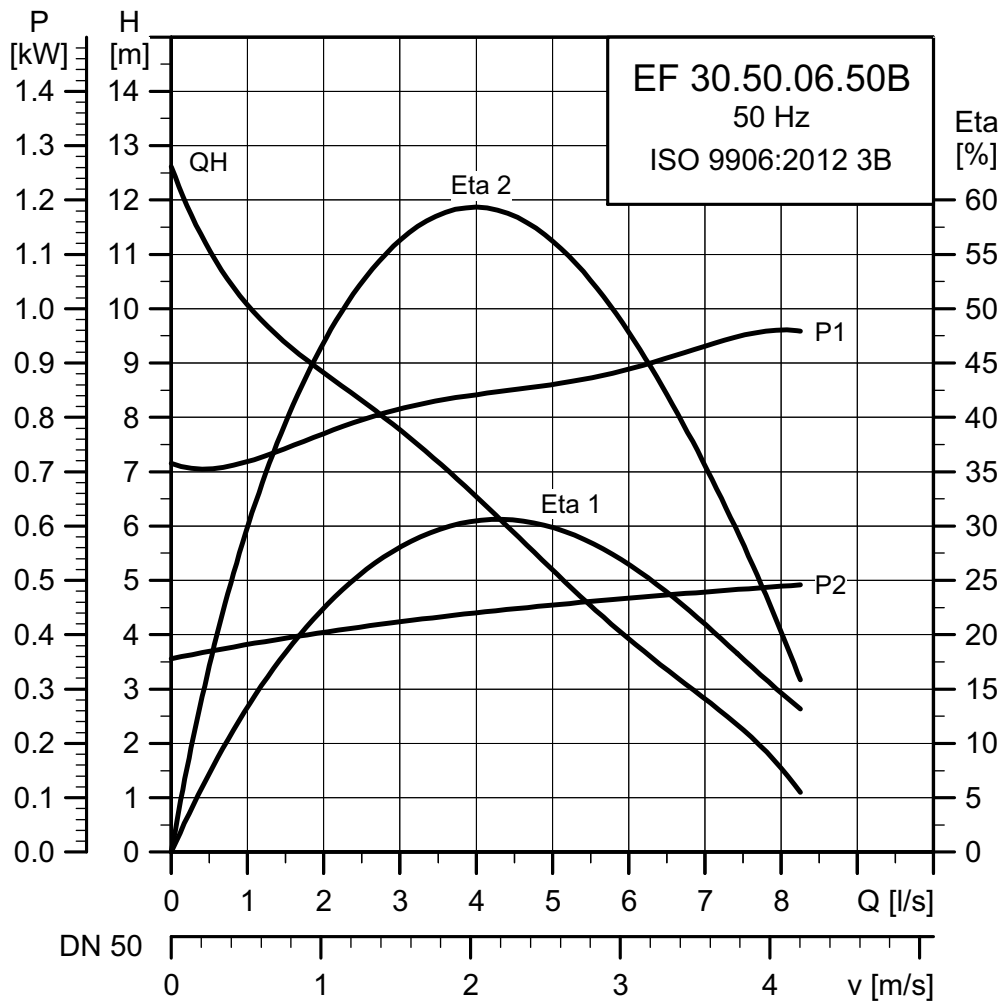
Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor [μF]	I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
									1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.0	0.6	2	2920	DOL	30	4.8	38	42	55	61	0.81	0.86	0.90	0.0035	7

Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

**EF 30.50.06.(A)/(E).(Ex).2.50B**



TM02 7468 1810

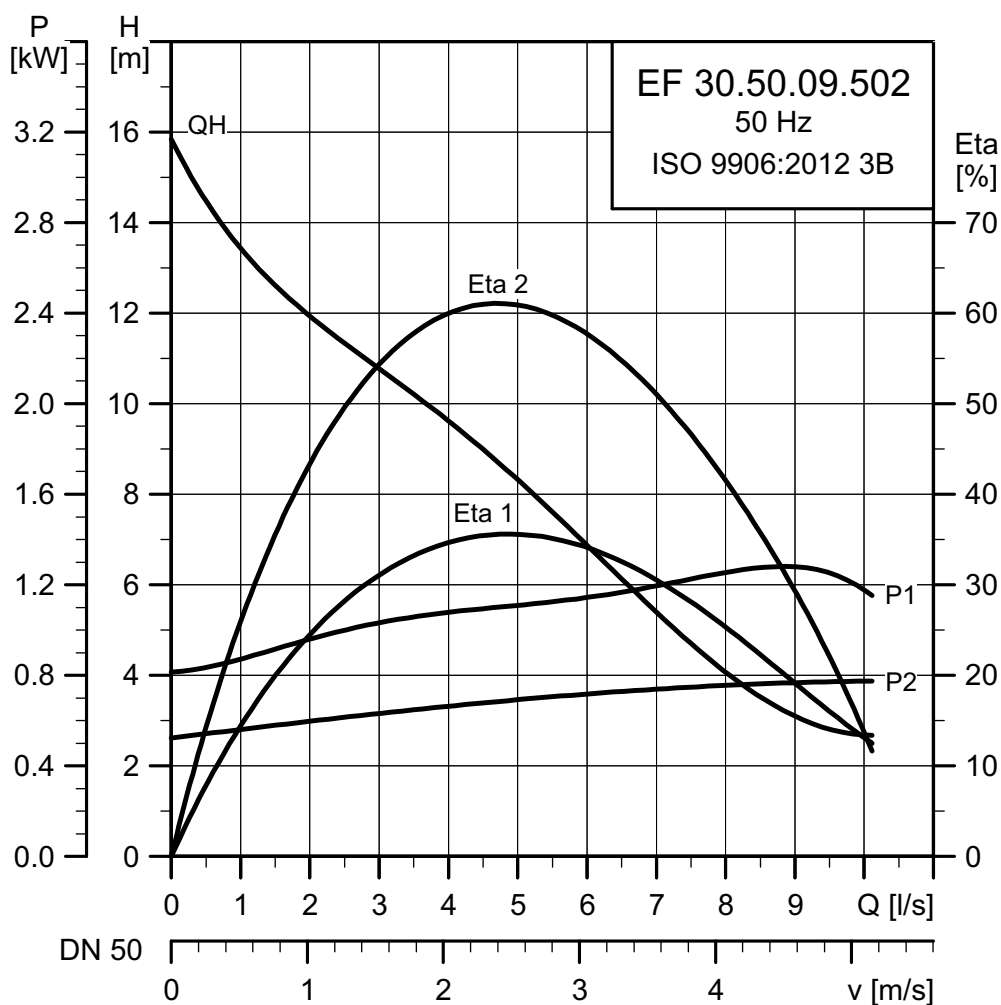
**Electrical data**

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 400-415	1.0	0.6	2	2920	DOL	2.3	21		43	53	59	0.50	0.58	0.65	0.0035	12			

**Pump data**

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## EF 30.50.09.(A)/(E).(Ex).2.1.502



TM02 7481 1810

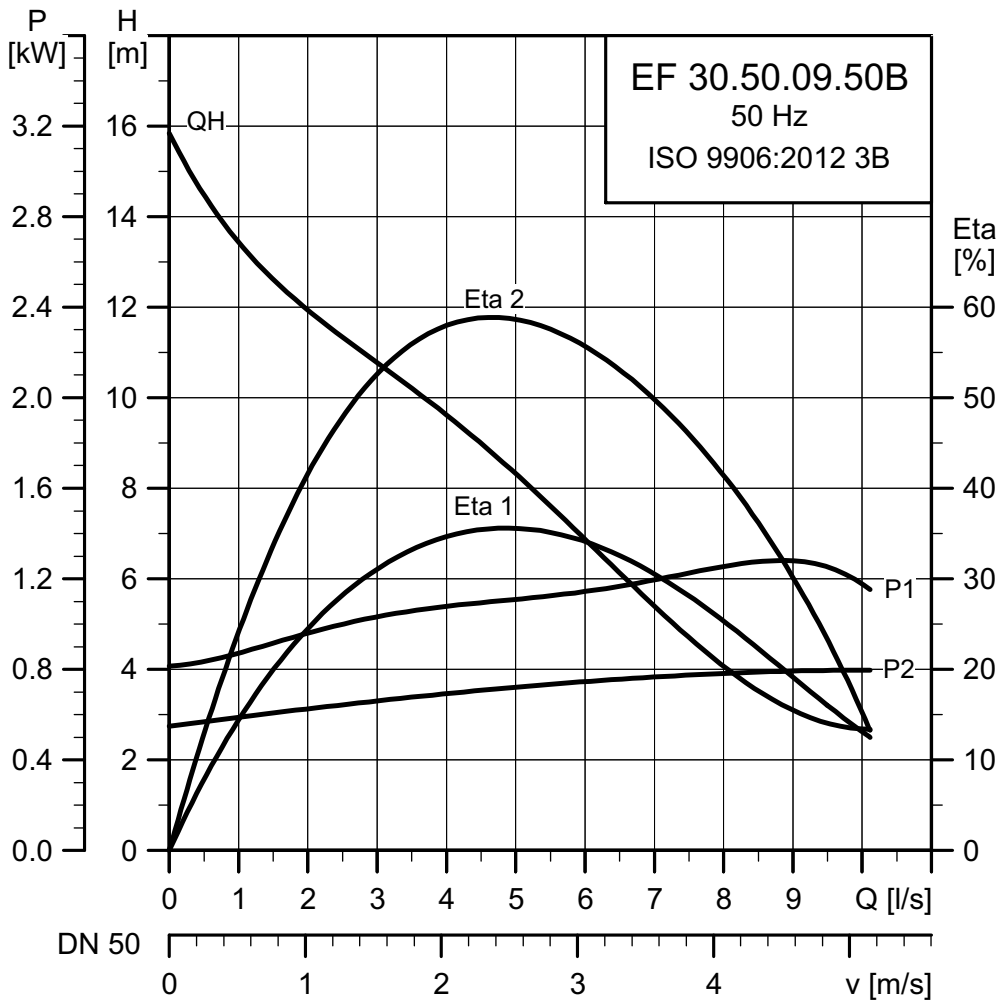
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor [μF]	I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
									1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.3	0.9	2	2870	DOL	30	6.1	38	55	63	67	0.86	0.92	0.96	0.037	7

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

**EF 30.50.09.(A)/(E).(Ex).2.50B**



TM02 7480 1810

**Electrical data**

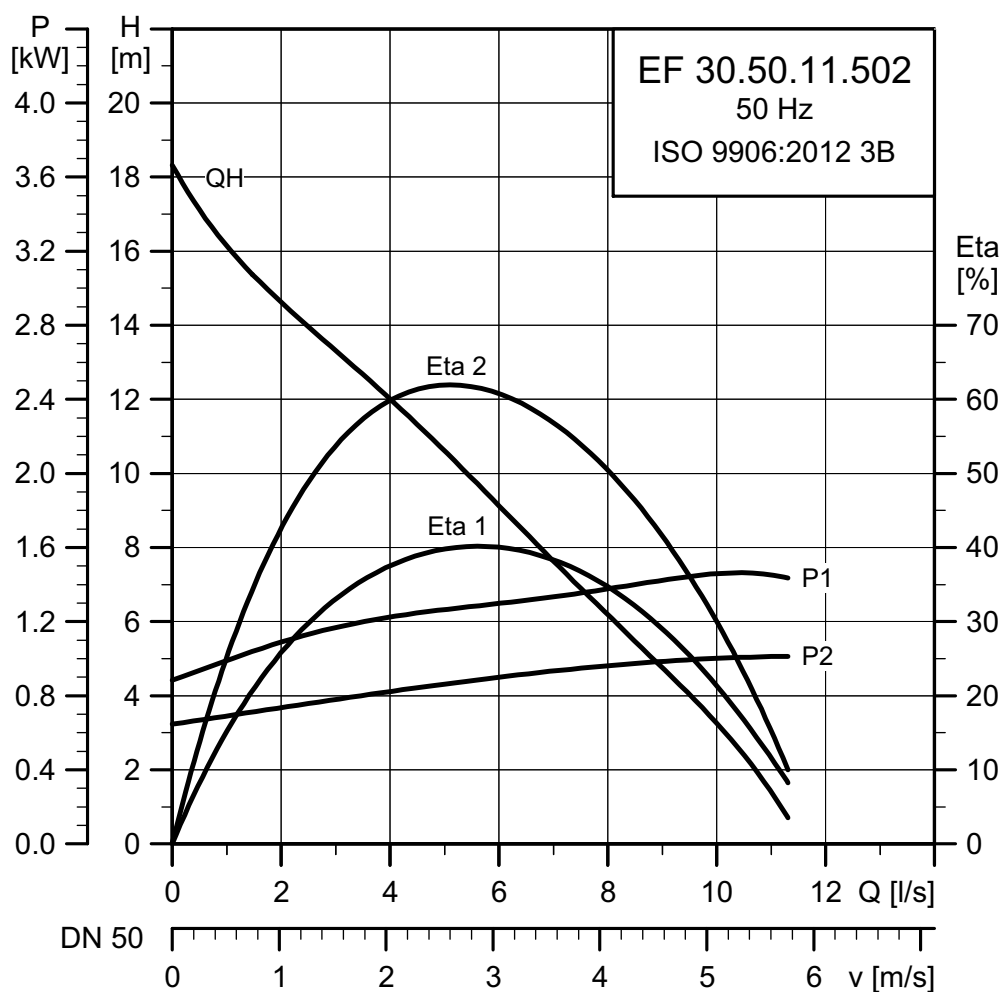
Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 400-415	1.4	0.9	2	2870	DOL	2.8	21		58	61	65	0.58	0.68	0.76	0.0037	12			

**Pump data**

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature		pH	Ex class
						[°C]	[°C]		
Semi-open	30	30	10	IP68	F	40		4-10	Ex d IIB T4/ Ex n IIB T4



EF 30.50.11.(A)/(E).(Ex).2.1.502



TM02 7467 1810

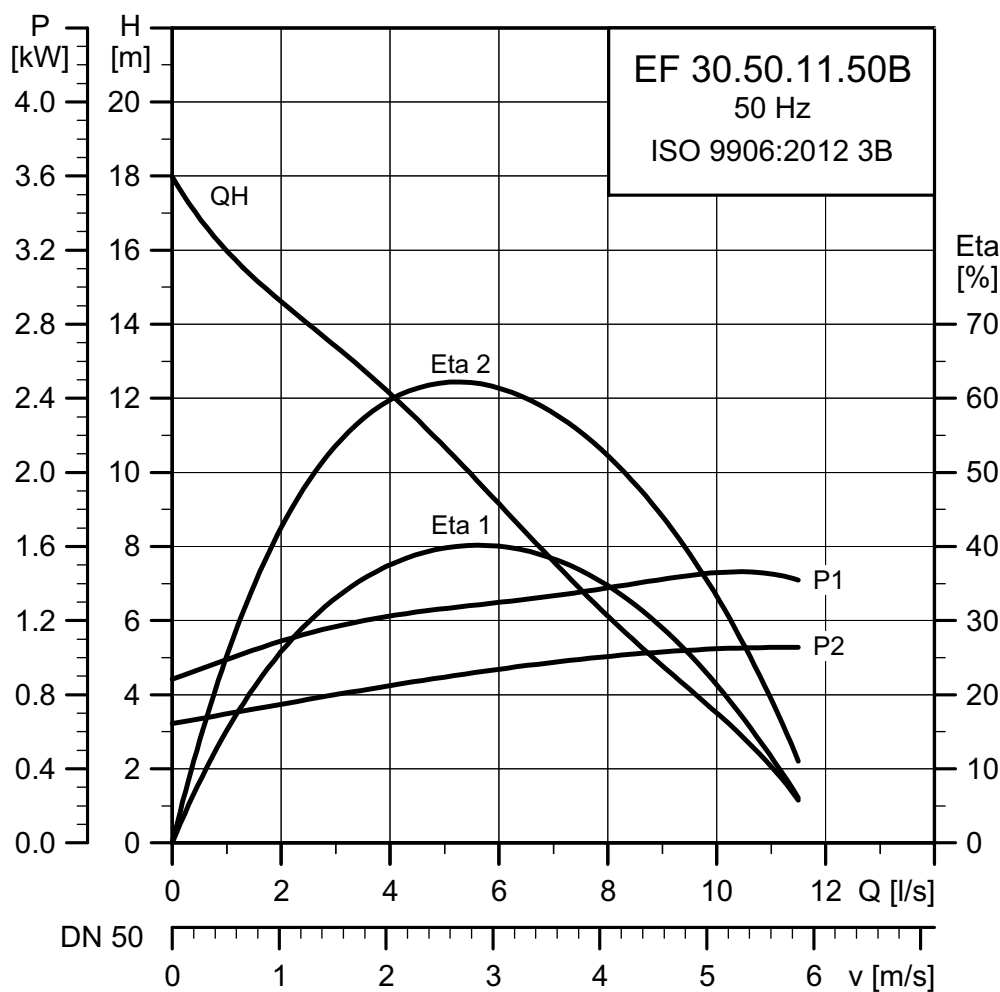
Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor			I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[μF]	[A]	[A]			1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.6	1.1	2	2830	DOL	30	7.4	38	60	66	67	0.89	0.96	0.97	0.0037	7		

Pump data

Impeller type	Max. solids size	Max. number of starts per hour	Max. installation depth	Enclosure class	Insulation class	Max. liquid temperature	pH	Ex class
	[mm]		[m]			[°C]		
Semi-open	30	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

## EF 30.50.11.(A)/(E).(Ex).2.50B



TM02 7466 1810

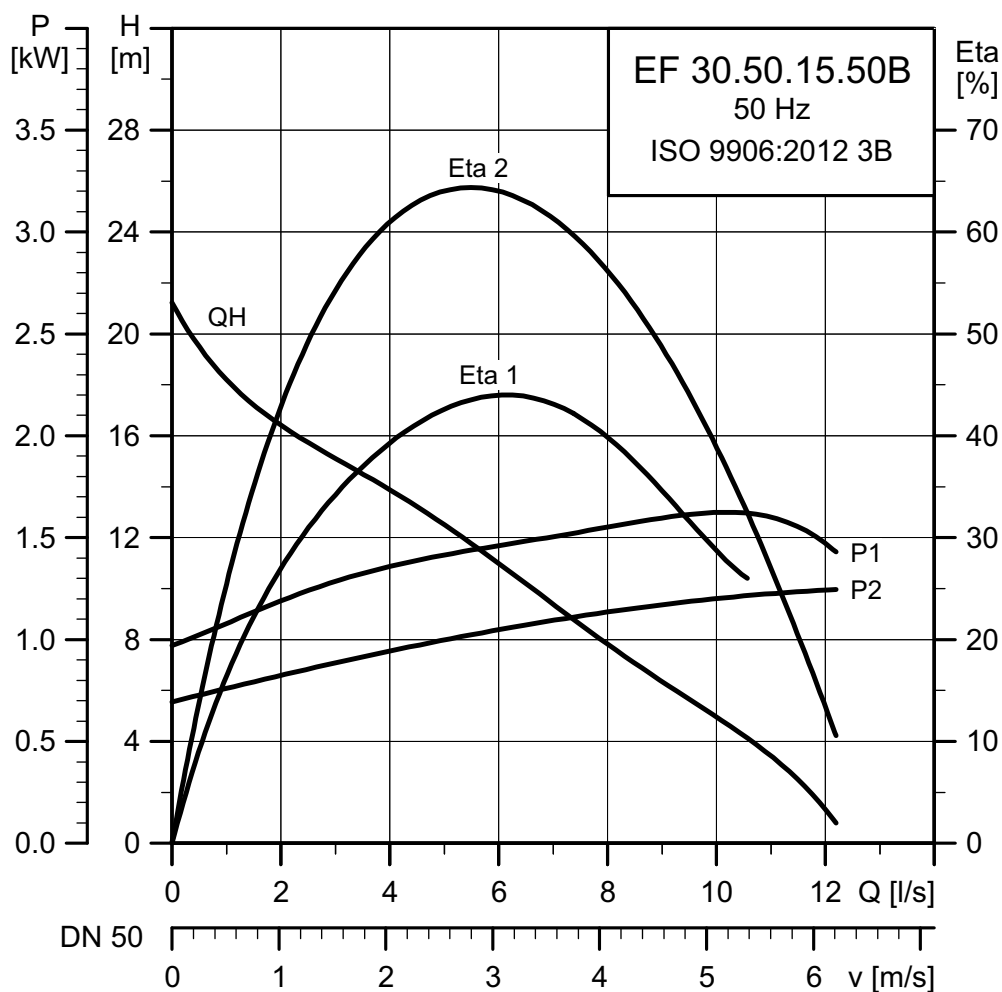
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	$n$ $\text{min}^{-1}$	Starting method	$I_N$			$\eta_{\text{motor}}$ [%]				$\text{Cos } \varphi$		Moment of inertia [ $\text{kgm}^2$ ]	Breakdown torque <sub>max.</sub> [Nm]
						$I_N$ [A]	$I_{\text{start}}$ [A]	$I_{\text{start}}/I_N$	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 400-415	1.6	1.1	2	2830	DOL	3.1	21	6.8	57	64	67	0.63	0.74	0.81	0.0037	12

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## EF 30.50.15.(A)/(E).(Ex).2.50B



TM02 7465 1810

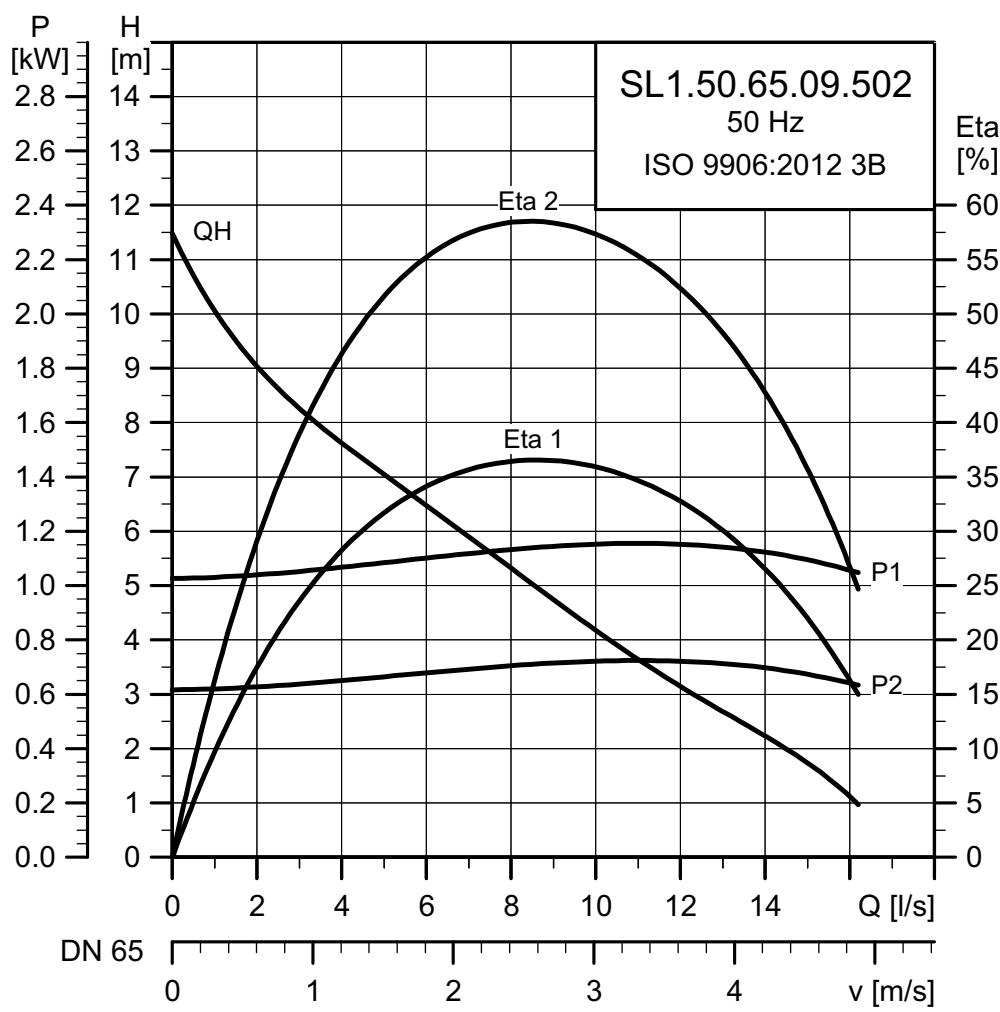
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	$\text{min}^{-1}$	Starting method	$I_N$			$\eta_{\text{motor}}$ [%]			Cos $\phi$			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						$I_N$ [A]	$I_{\text{start}}$ [A]	$I_{\text{start}}/I_N$	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 400-415	2.2	1.5	2	2720	DOL	3.8	21	5.5	63	68	67	0.71	0.81	0.88	0.0039	12

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

### SL1.50.65.09.(A)/(E).(Ex).2.1.502



TM04 9100 3410

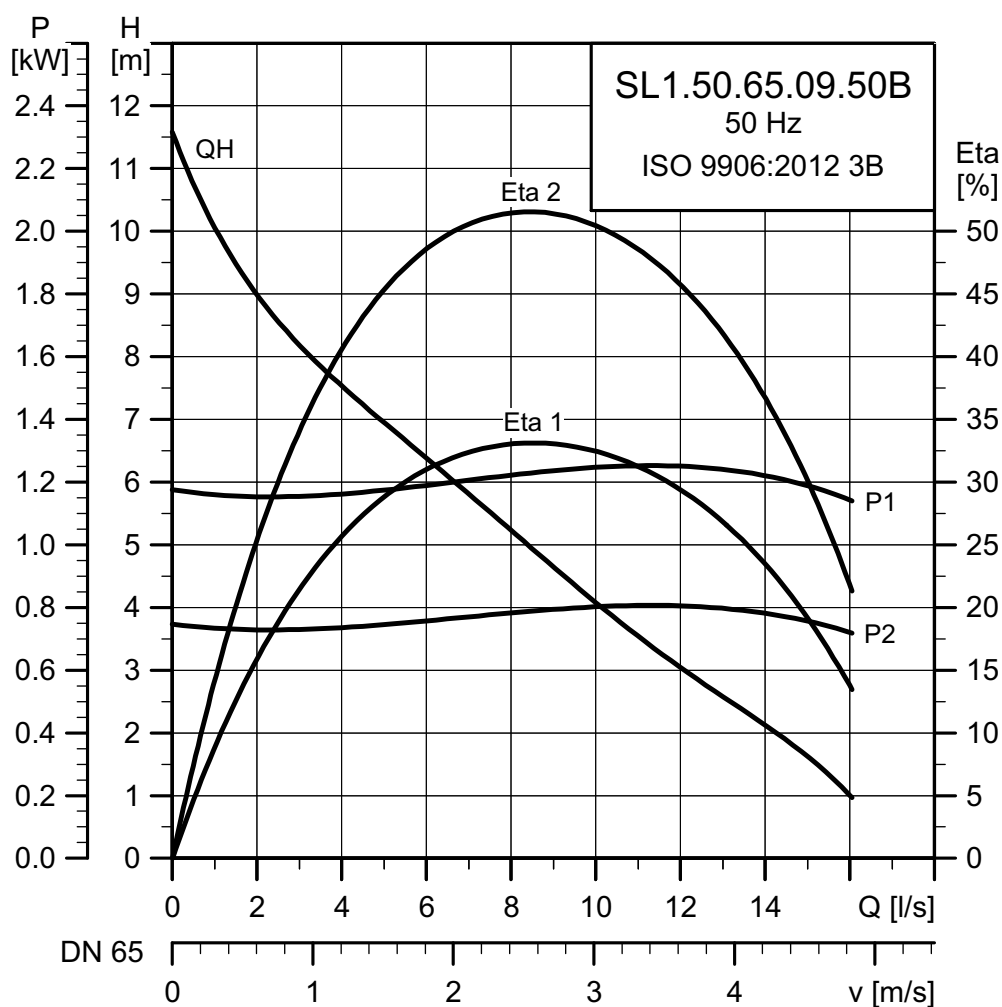
#### Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor [μF]	I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
									1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.3	0.9	2	2920	DOL	30	6.1	38	55	63	67	0.86	0.92	0.96	0.004	7

#### Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## SL1.50.65.09.(A)/(E).(Ex).2.50B/C



TM04 9101 3410

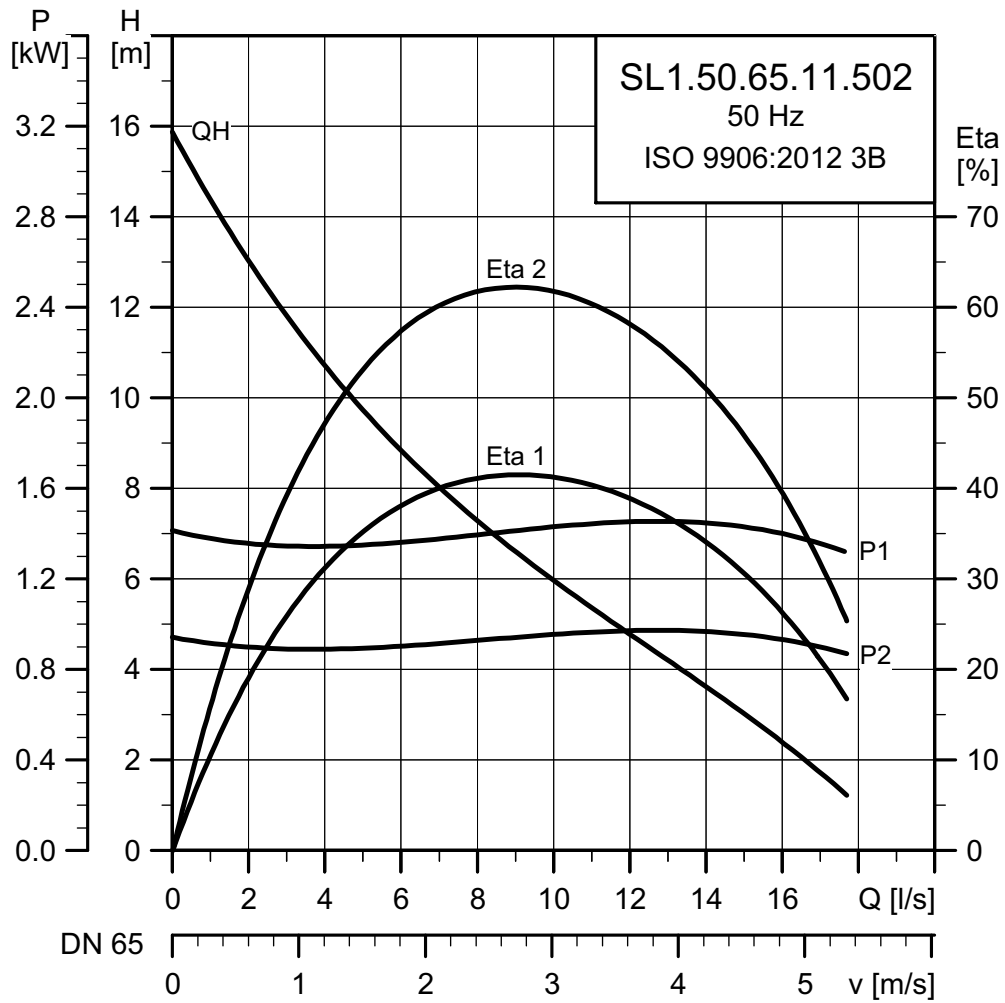
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						I <sub>N</sub> [A]	I <sub>start</sub> [A]	I <sub>start</sub> [A]	1/2	3/4	1/1	1/2	3/4	1/1					
3 x 230-240	1.4	0.9	2	2920	DOL	4.9	36	58	61	65	0.50	0.58	0.65	0.004	12				
3 x 400-415	1.4	0.9	2	2920	DOL	2.8	21	58	61	65	0.58	0.68	0.76	0.004	12				

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class
Channel	50	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

**SL1.50.65.11.(A)/(E).(Ex).2.1.502**



TM04 9102 3410

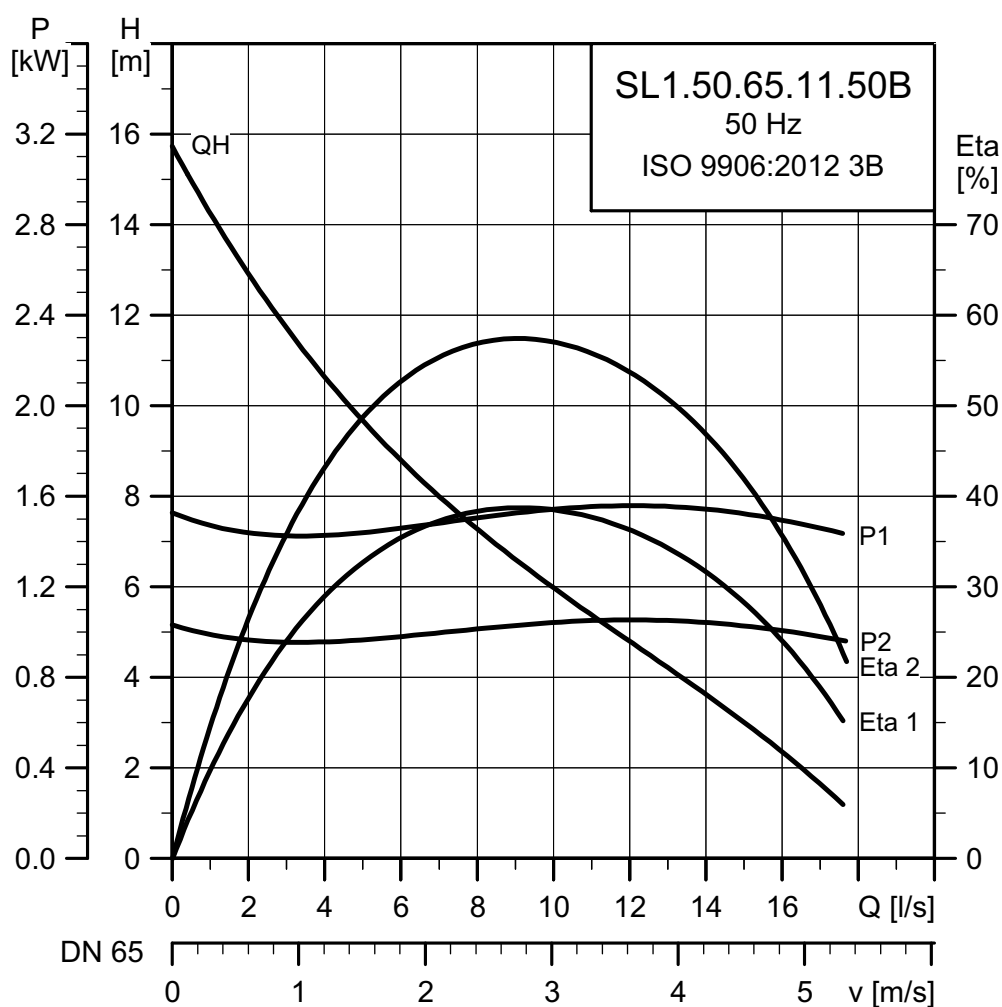
**Electrical data**

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor [μF]	I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
									1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.6	1.1	2	2920	DOL	30	7.4	38	60	66	67	0.89	0.96	0.97	0.004	7

**Pump data**

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class
Channel	50	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

## SL1.50.65.11.(A)/(E).(Ex).2.50B/C



TM04 9103 3410

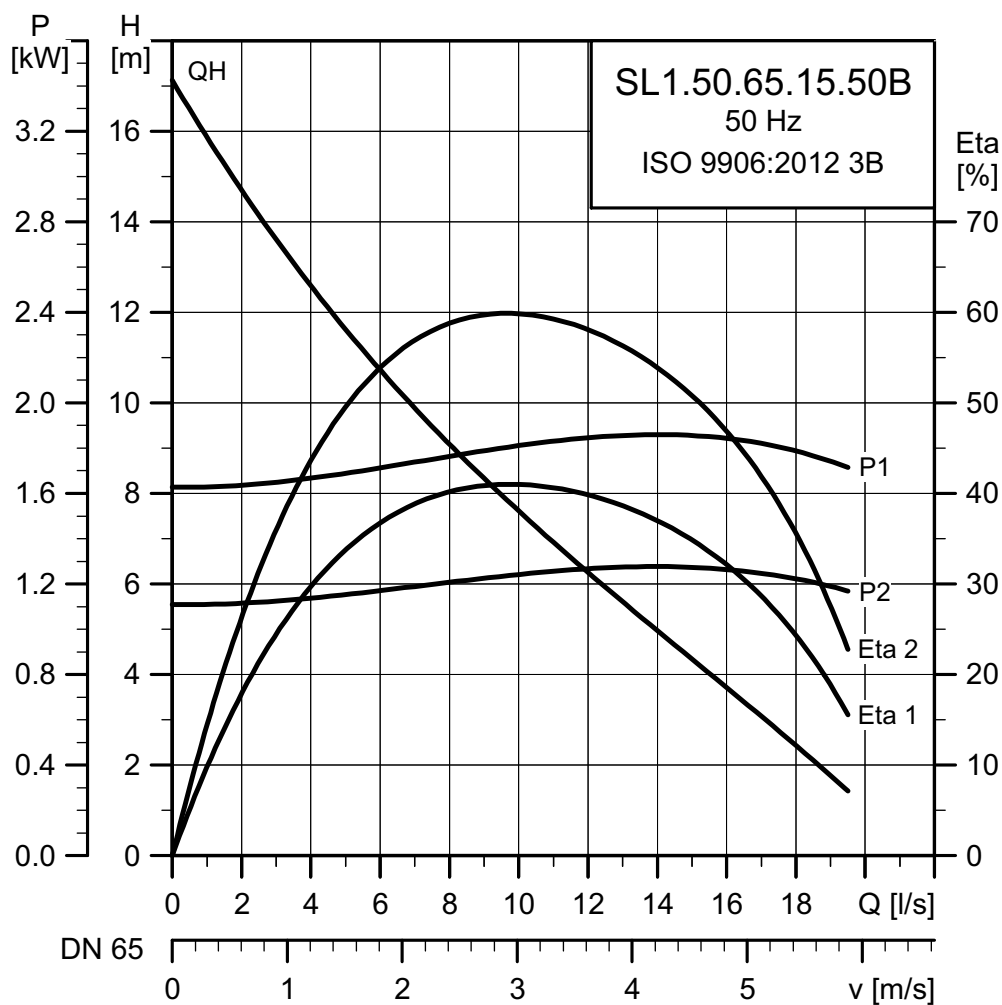
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						I <sub>N</sub> [A]	I <sub>start</sub> [A]		1/2	3/4	1/1	1/2	3/4	1/1					
3 x 230-240	1.6	1.1	2	2830	DOL	5.2	36		57	64	67	0.63	0.74	0.81	0.0043	12			
3 x 400-415	1.6	1.1	2	2830	DOL	3.1	21		57	64	67	0.63	0.74	0.81	0.0043	12			

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## SL1.50.65.15.(A)/(E).(Ex).2.50B/C



TM04 9104 3410

## Electrical data

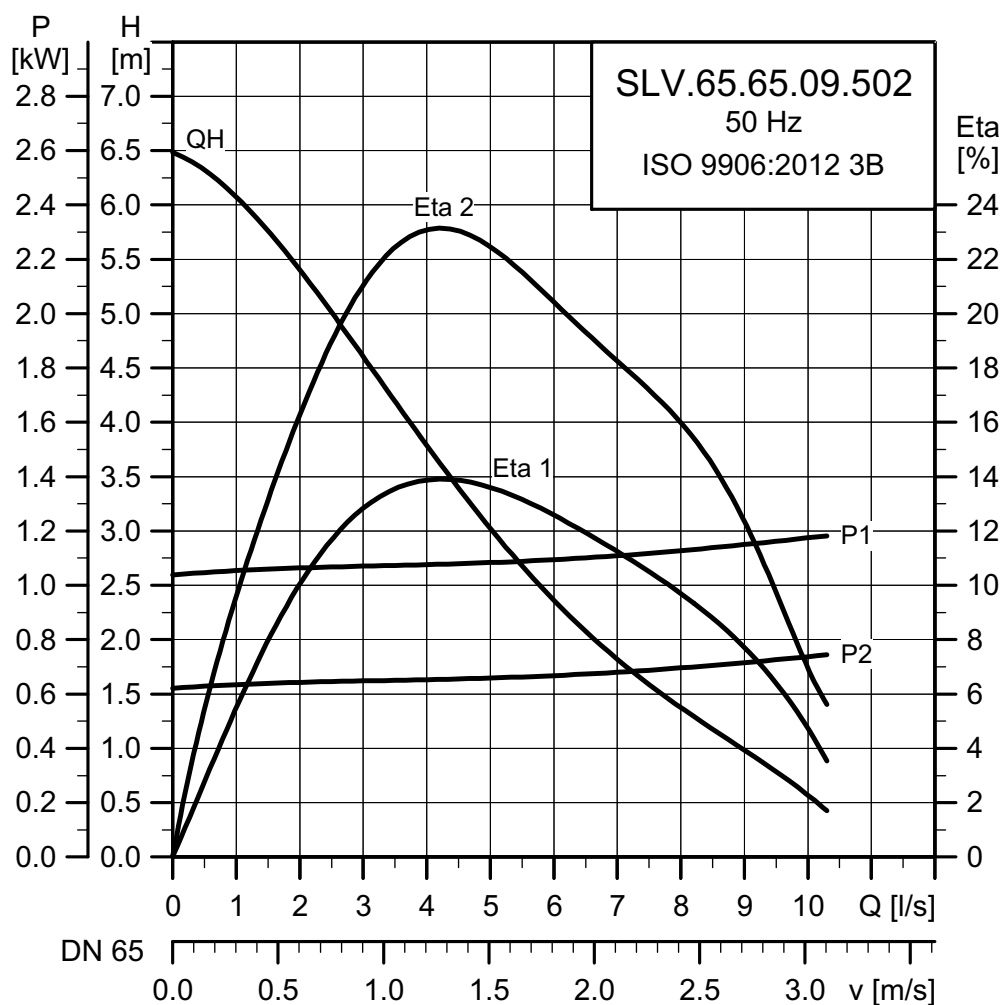
Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 230-240	2.2	1.5	2	2720	DOL	6.6	36	67	68	63	0.88	0.81	0.71	0.004	12				
3 x 400-415	2.2	1.5	2	2720	DOL	3.8	21	67	68	63	0.88	0.81	0.71	0.004	12				

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class



### SLV.65.65.09.(A)/(E).(Ex).2.1.502



TM04 9105 3410

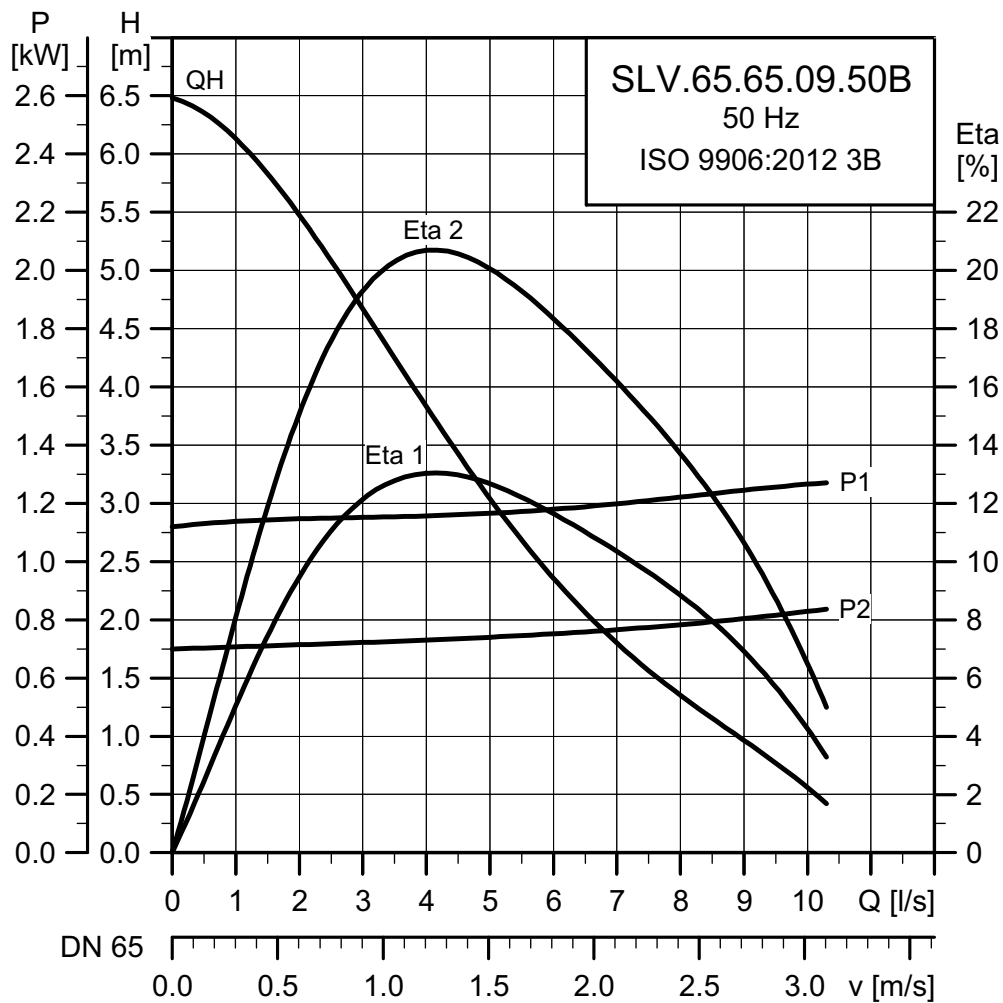
#### Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor [μF]	I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
									1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.3	0.9	2	2920	DOL	30	6.1	38	55	63	67	0.86	0.92	0.96	0.004	7

#### Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

### SLV.65.65.09.(A)/(E).(Ex).2.50B



TM04 9106 3410

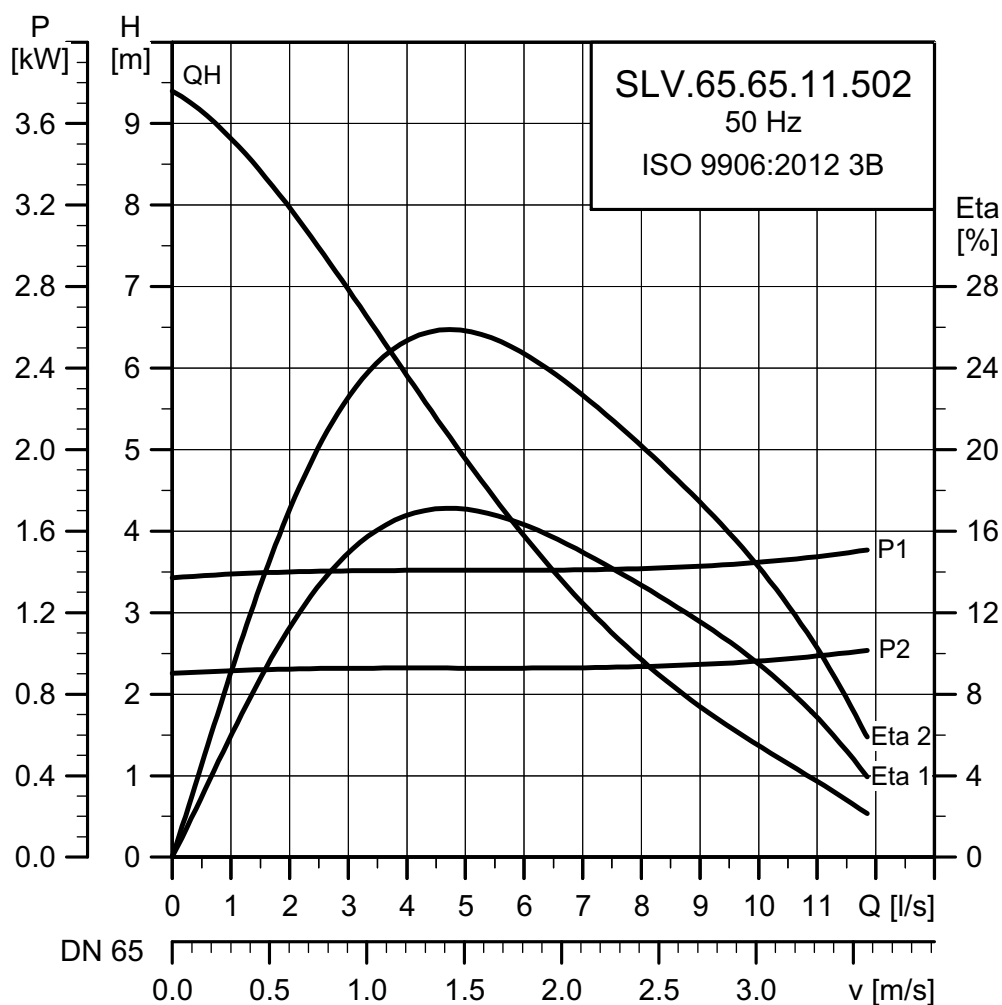
#### Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 230-240	1.4	0.9	2	2920	DOL	4.9	36	58	61	65	0.50	0.58	0.65	0.004	12				
3 x 400-415	1.4	0.9	2	2920	DOL	2.8	21	58	61	65	0.58	0.68	0.76	0.004	12				

#### Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class
Channel	65	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

## SLV.65.65.11.(A)/(E).(Ex).2.1.502



TM04 9107 3410

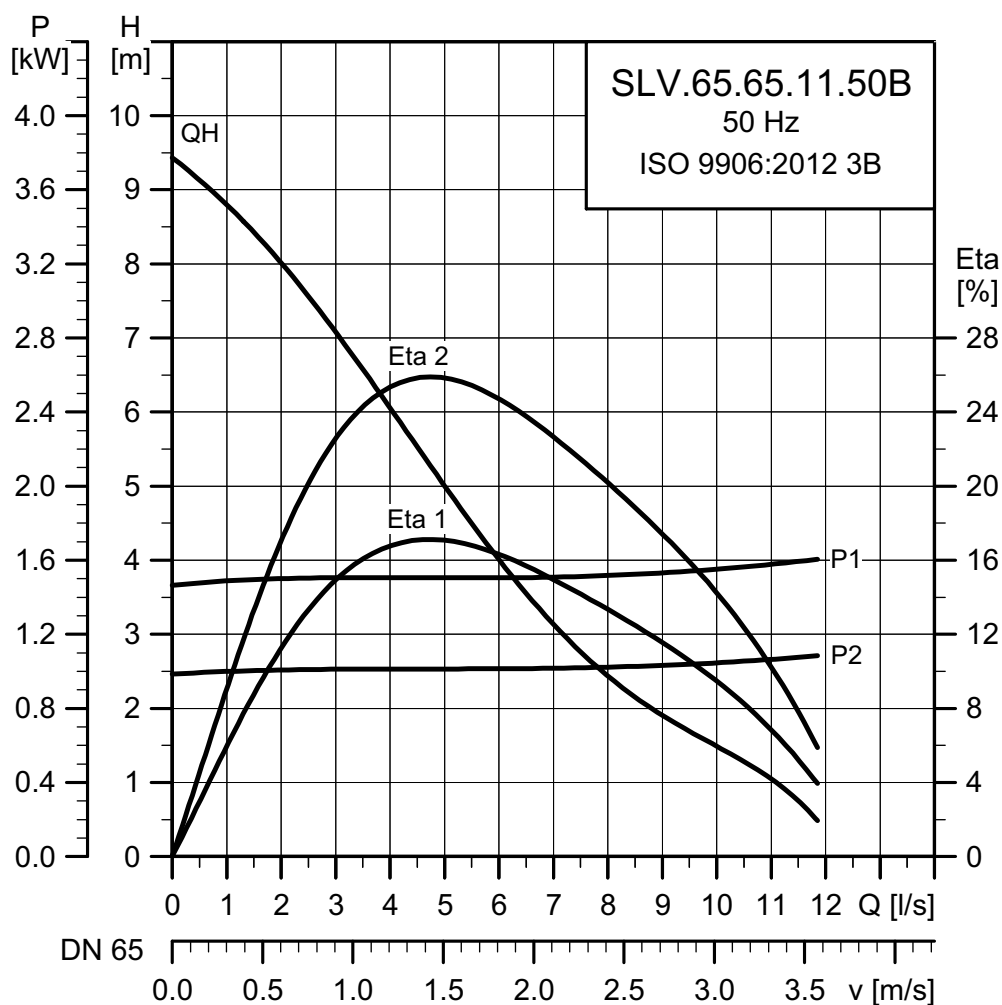
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	Run capacitor			I <sub>N</sub> [A]	I <sub>start</sub> [A]	η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[μF]					1/2	3/4	1/1	1/2	3/4	1/1		
1 x 230	1.6	1.1	2	2920	DOL	30			7.4	38	60	66	67	0.89	0.96	0.97	0.004	7

## Pump data

Impeller type	Max. solids size	Max. number of starts per hour	Max. installation depth	Enclosure class	Insulation class	Max. liquid temperature	pH	Ex class
	[mm]		[m]			[°C]		
Channel	65	30	10	IP68	F	40	4-10	Ex d IIB T4/ Ex n IIB T4

## SLV.65.65.11.(A)/(E).(Ex).2.50B



TM04 7192 1810

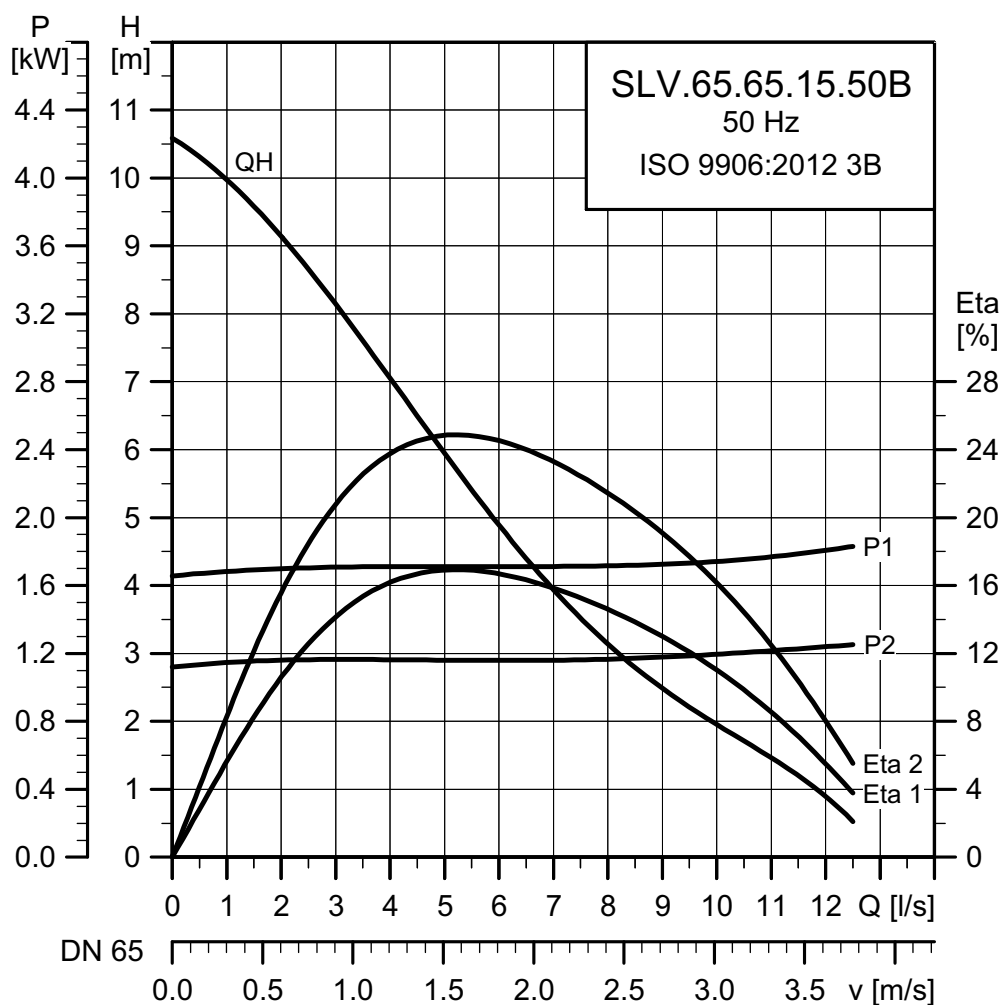
## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 230-240	1.6	1.1	2	2830	DOL	5.2	36	57	64	67	0.63	0.74	0.81	0.0043	12				
3 x 400-415	1.6	1.1	2	2830	DOL	3.1	21	57	64	67	0.63	0.74	0.81	0.0043	12				

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

## SLV.65.65.15.(A)/(E).(Ex).2.50B



TM04 7193 1810

## Electrical data

Voltage [V]	P1 [kW]	P2 [kW]	Number of poles	min <sup>-1</sup>	Starting method	I <sub>N</sub>			I <sub>start</sub>			η <sub>motor</sub> [%]			Cos φ			Moment of inertia [kgm <sup>2</sup> ]	Breakdown torque <sub>max.</sub> [Nm]
						[A]	[A]	[A]	1/2	3/4	1/1	1/2	3/4	1/1	1/2	3/4	1/1		
3 x 230-240	2.2	1.5	2	2720	DOL	6.6	36	67	68	63	0.88	0.81	0.71	0.004	12				
3 x 400-415	2.2	1.5	2	2720	DOL	3.8	21	67	68	63	0.88	0.81	0.71	0.004	12				

## Pump data

Impeller type	Max. solids size [mm]	Max. number of starts per hour	Max. installation depth [m]	Enclosure class	Insulation class	Max. liquid temperature [°C]	pH	Ex class

# 11. Dimensions

## DP and EF

### Auto-coupling installation

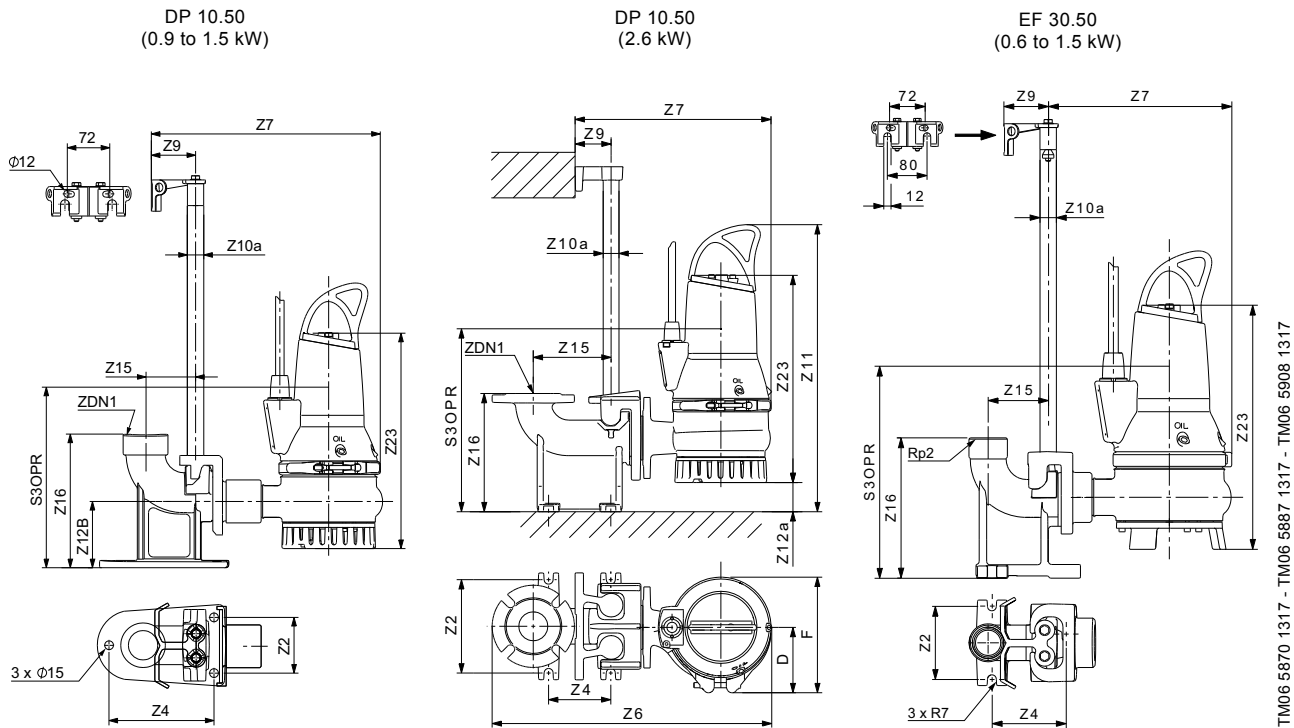


Fig. 35 Auto-coupling installation of standard pumps

TM06 5870 1317 - TM06 5887 1317 - TM06 5908 1317

Power [kW]	D	F	Z2	Z4	Z6	Z7	Z9	Z10a	Z11	Z12A	Z12B	Z15	Z16	Z23	ZDN1	S3OPR	Weight [kg]
DP 0.9 and 1.5	117	218	115	118	-	370	70	1"	533	30	128	90	226	388	Rp 2	324	39
DP 2.6	137	252	210	140	623	436	81	1 1/2"	651	64	-	175	266	462	DN 65	391	39
EF 0.6, 0.9, 1.1 and 1.5	117	218	115	118	-	370	70	1"	530	30	128	90	226	385	Rp 2	323	36

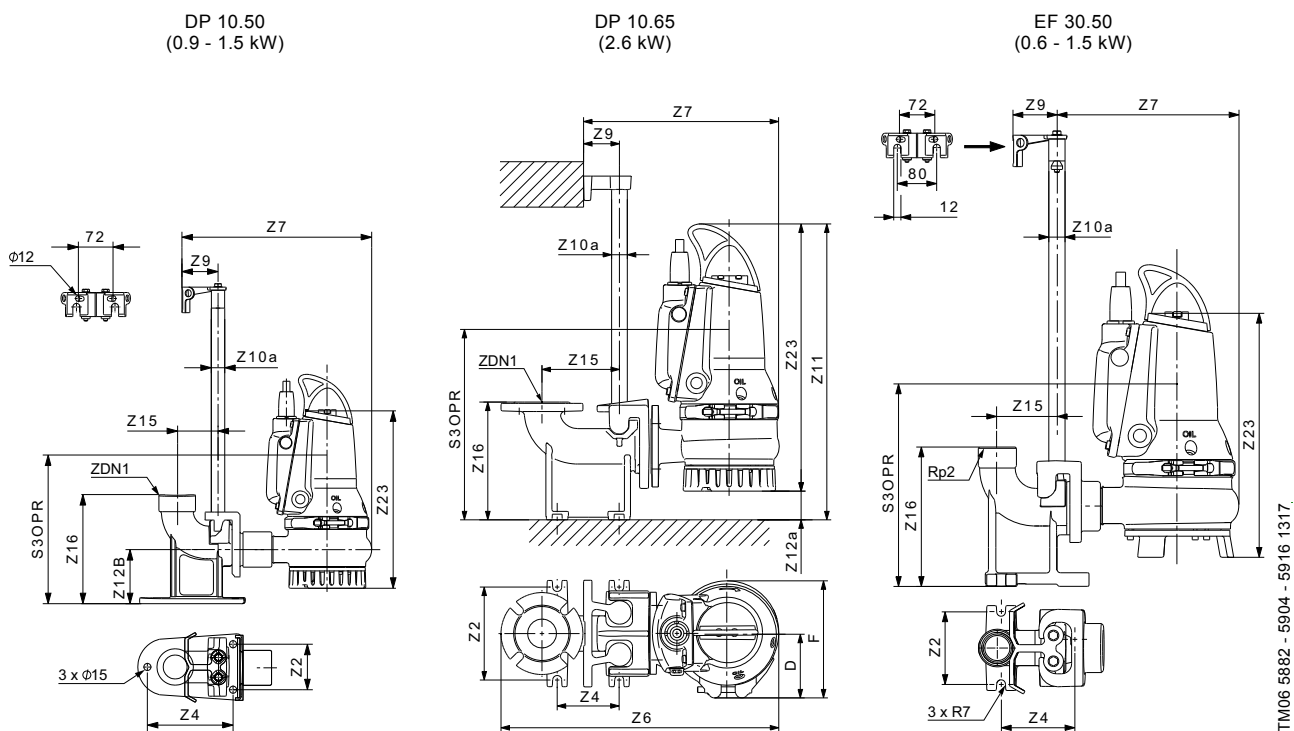


Fig. 36 Auto-coupling installation of AUTO<sub>ADAPT</sub> pumps

Power [kW]	D	F	Z2	Z4	Z6	Z7	Z9	Z10a	Z11	Z12A	Z12B	Z15	Z16	Z23	ZDN1	S3OPR	Weight [kg]
DP 0.9 and 1.5	117	150	115	118	325	370	70	1"	523	30	128	90	226	393	Rp 2	324	39
DP 2.6	137	252	210	140	623	436	81	1 1/2"	671	64	-	175	266	472	DN 65	391	68
EF 0.6, 0.9, 1.1 and 1.5	117	150	115	118	-	370	70	1"	520	30	220	90	226	390	Rp 2	323	38

Hookup auto-coupling installation

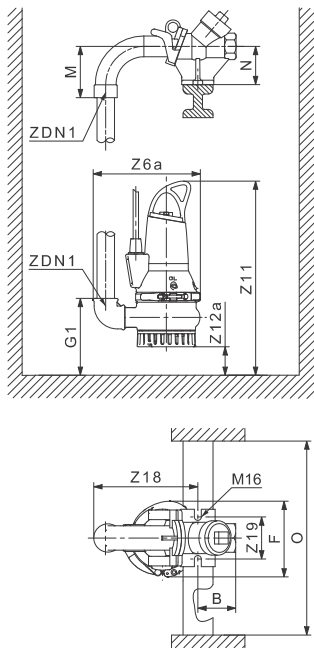


Fig. 37 DP 10.50, 0.9 - 1.5 kW

TM06 5871 0316

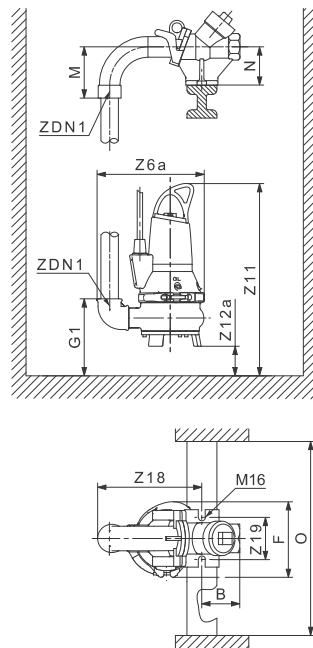


Fig. 38 EF 30.50, 0.6 - 1.5 kW

TM06 5909 0316

Power [kW]	B	F	G1	Z6a	M	N	O	Z11	Z12a	Z18	Z19	ZDN1	Weight [kg]
DP 0.9 and 1.5	75	218	160	325	140	100	600	523	30	286	110	R2	39
EF 0.6, 0.9, 1.1 and 1.5	75	218	163	325	140	100	600	520	30	286	110	R2	38

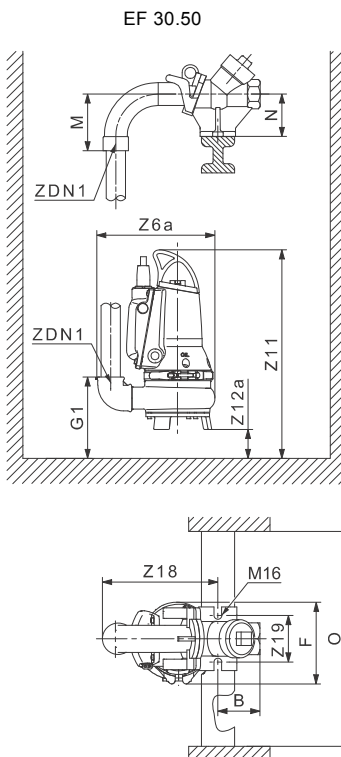
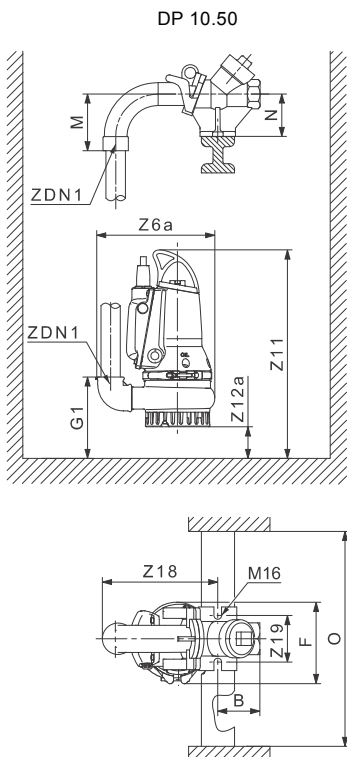


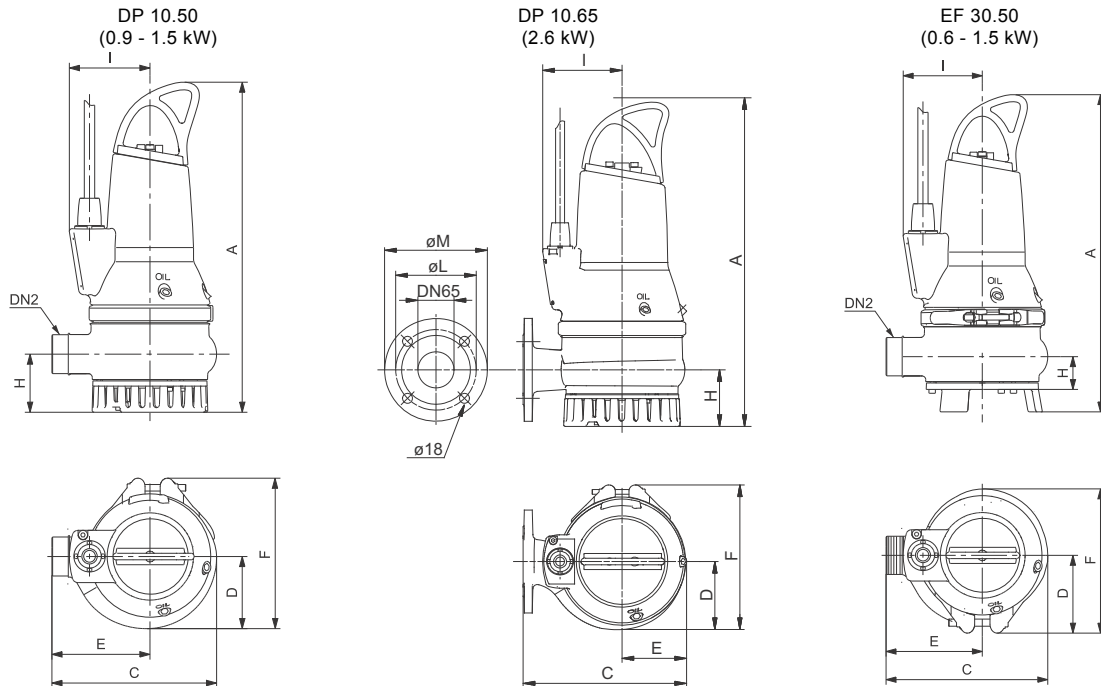
Fig. 39 DP 10.50 AUTO<sub>ADAPT</sub>, 0.9 - 1.5 kW and EF 30.50 AUTO<sub>ADAPT</sub>, 0.6 - 1.5 kW

TM06 5883 0316

Power [kW]	B	F	G1	Z6a	M	N	O	Z11	Z12a	Z18	ZDN1	Z19	Weight [kg]
DP 0.9 and 1.5	75	218	160	325	140	100	600	523	30	286	R2	110	39
EF 0.6, 0.9, 1.1 and 1.5	75	218	163	325	140	100	600	520	30	286	R2	110	38



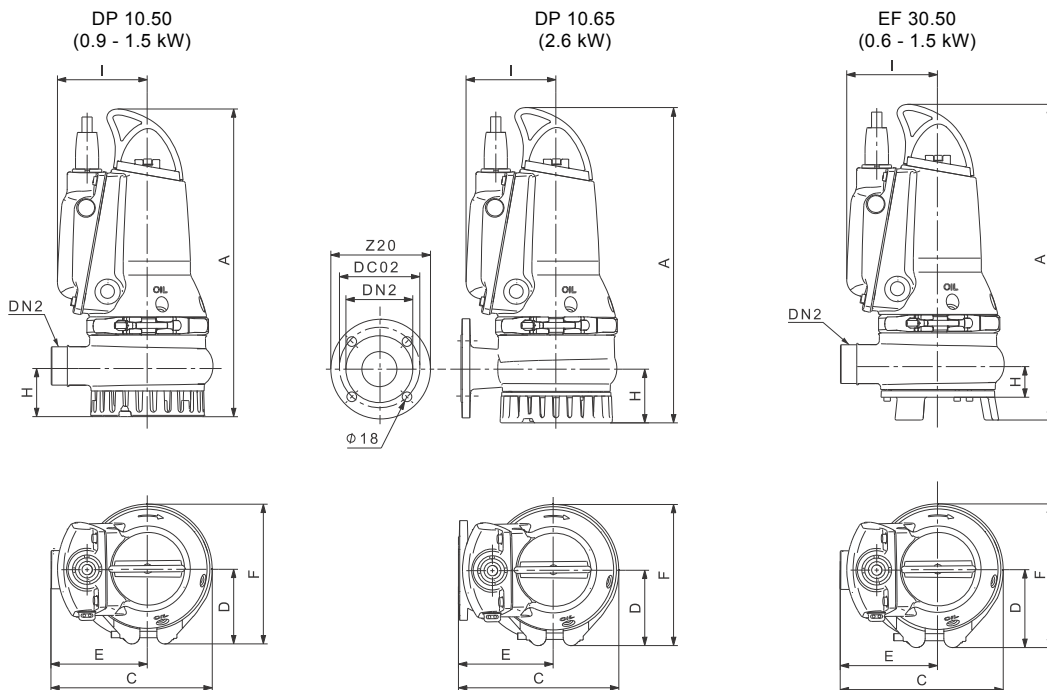
Free-standing installation



TM06 5869 0316 - TM06 5982 0316 - TM06 5907 0316

Fig. 40 Free-standing installation of standard pumps

Power [kW]	A	C	D	E	F	H	DC02	Z20	DN2	I	Weight [kg]
DP 0.9 and 1.5	493	252	117	150	218	87	-	-	R2	123	39
DP 2.6	592	294	137	180	252	102	143	185	DN 65	143	61
EF 0.6, 0.9, 1.1 and 1.5	504	252	117	150	218	84	-	-	R2	123	38



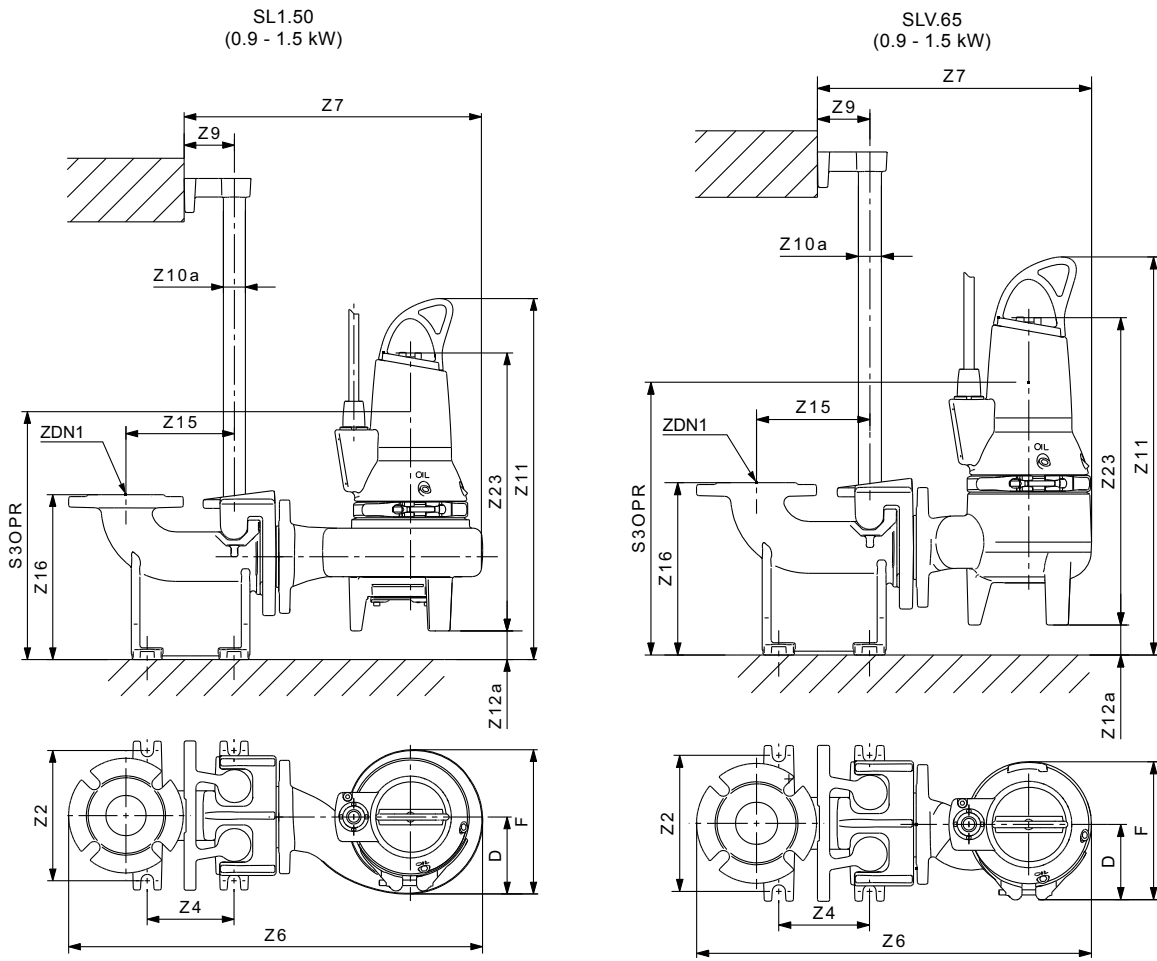
TM06 5881 0316 - TM06 5915 0316

Fig. 41 Free-standing installation of AUTO<sub>ADAPT</sub> pumps

Power [kW]	A	C	D	E	F	H	DC02	Z20	DN2	I	Weight [kg]
DP 0.9 and 1.5	503	252	117	150	218	87	145	-	Rs 2	123	39
DP 2.6	587	294	137	180	252	102	145	185	DN 65	143	68
EF 0.6, 0.9, 1.1 and 1.5	490	252	117	150	218	84	145	-	Rs 2	141	38

## SL1 and SLV

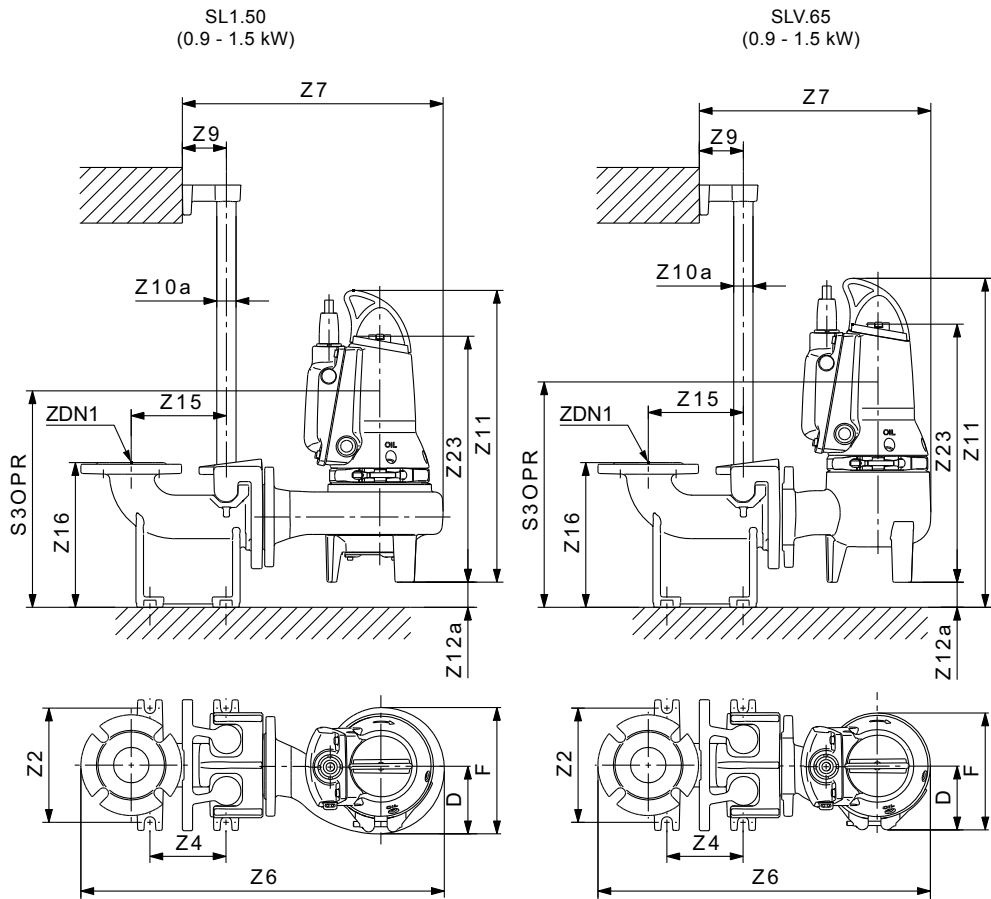
### Auto-coupling installation



TM06 5930 - 5938 1317

Fig. 42 Auto-coupling installation of standard pumps

Power [kW]	D	F	Z2	Z4	Z6	Z7	Z9	Z10a	Z11	Z12a	Z15	Z16	Z23	ZDN1	S3OPR	Weight [kg]
SL1 0.9, 1.1 and 1.5	126	236	210	140	661	485	81	1 1/2"	599	43	175	266	411	DN 65	377	48
SLV 0.9, 1.1 and 1.5	119	216	210	140	598	423	81	1 1/2"	621	45	175	266	461	DN 65	398	41

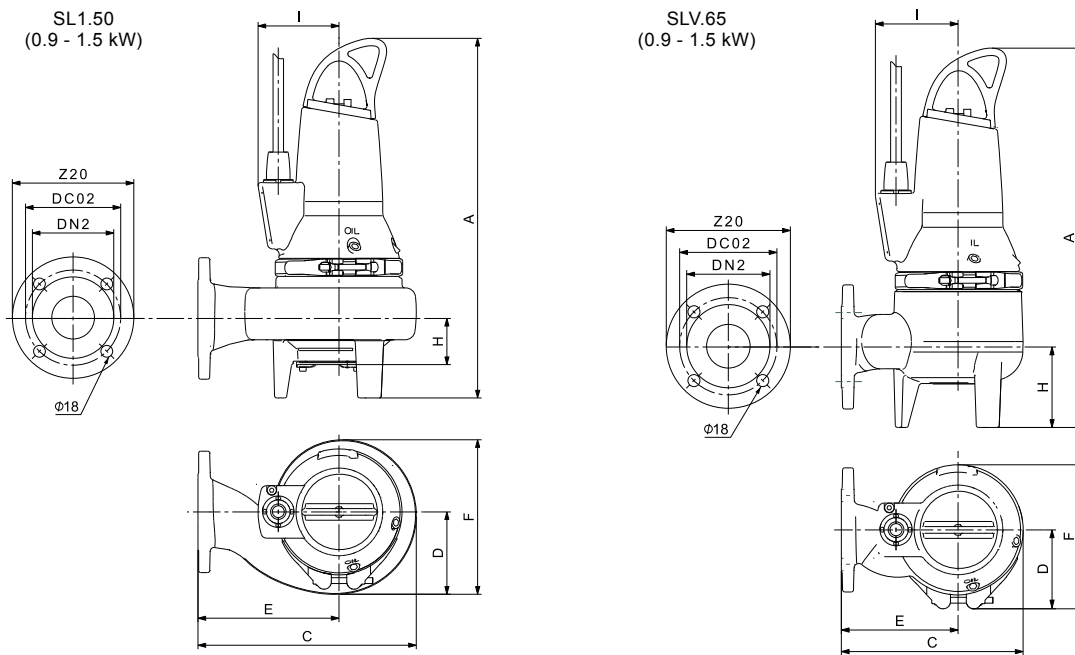


TM06 5935 1317

Fig. 43 Auto-coupling installation of AUTO<sub>ADAPT</sub> pumps

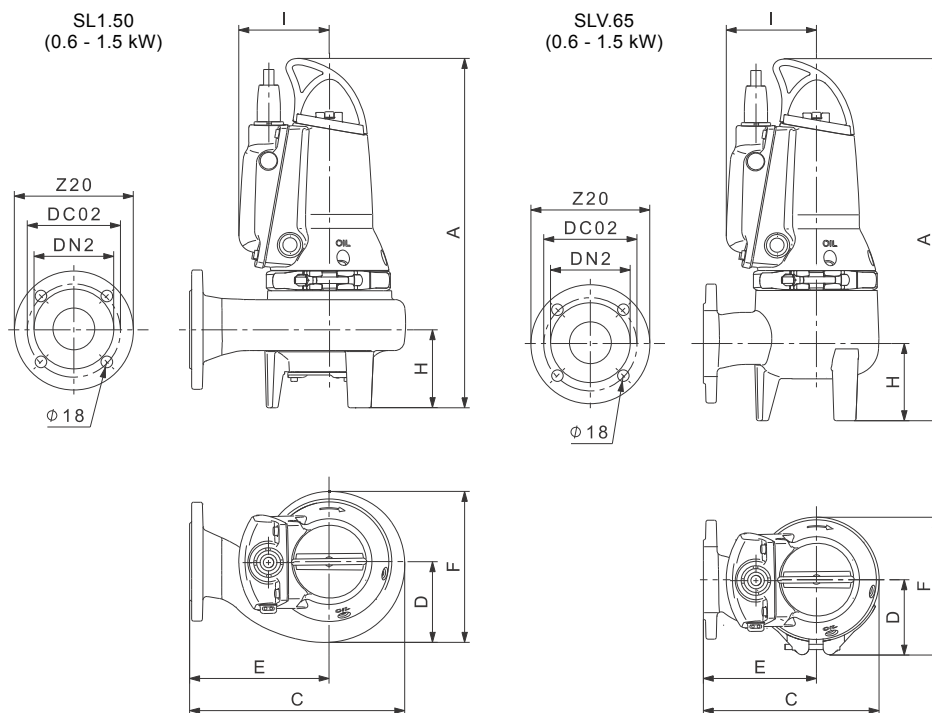
Power [kW]	D	F	Z2	Z4	Z6	Z7	Z9	Z10a	Z11	Z12a	Z15	Z16	Z23	ZDN1	S3OPR	Weight [kg]
SL1 0.9 and 1.5	126	236	210	140	661	485	81	1 1/2"	588	43	175	266	445	DN 65	377	48
SLV 0.9 and 1.5	119	216	210	140	598	423	81	1 1/2"	610	45	175	266	465	DN 65	398	41

**Free-standing installation**



**Fig. 44** Free-standing installation of standard pumps

Power [kW]	A	C	D	E	F	H	I	DC02	Z20	DN2	Weight [kg]
SL1 0.9, 1.1 and 1.5	544	333	126	217	236	121	123	145	185	DN 65	48
SLV 0.9, 1.1 and 1.5	565	271	119	176	216	120	123	145	185	DN 65	41








**Fig. 45** Free-standing installation of AUTO<sub>ADAPT</sub> pumps


Power [kW]	A	C	D	E	F	H	I	DC02	Z20	DN2	Weight [kg]
SL1 0.9, 1.1 and 1.5	544	333	126	217	236	121	141	145	185	DN 65	48
SLV 0.9, 1.1 and 1.5	565	271	119	176	216	120	141	145	185	DN 65	41



## 12. Accessories

### Installation systems

No	Product	Description	Dimensions	SL1.50.65	SLV.65.65	DP10.50	DP10.65	EF30.50	Product number
1		TM01 7173 1409 Lifting chain with shackle. With certificates Stainless steel (1.4571/A4) Up to 320 kg	2 m	•	•	•	•	•	98989662
			3 m	•	•	•	•	•	98989664
			4 m	•	•	•	•	•	98989666
			6 m	•	•	•	•	•	98989668
			8 m	•	•	•	•	•	98989670
			10 m	•	•	•	•	•	98989672
2		TM05 7684 1513 Complete auto-coupling system, including guide claw, base plate and upper guide rail bracket. Cast iron, epoxy-coated.	Rp 2			•		•	97644486
3		TM04 4490 1409 Complete auto-coupling system, including guide claw, base plate and upper guide rail bracket. Cast iron, epoxy-coated.	DN 65	•	•		•		96090992
			DN 80 / DN 65	•	•		•		96102238
4		TM04 6063 4809 Hook-up auto-coupling.	2"			•		•	96004445
5		TM05 7683 1513 Intermediate guide rail bracket in guide rail system In installations with guide rails longer than 4 m, it is recommended to use intermediate guide rail bracket.	Kit, IGRH DN40, AISI 304	•	•	•	•	•	96887609

## Other accessories

No	Product	Description	DP / EF / SL1 / SLV	Product number
6		TM04 7452 2010 Grundfos Powerline PC Tool Link USB communication unit.	-	All AUTO <sub>ADAPT</sub> pumps 97655366
7		TM05 3887 1612 For Grundfos GO: MI 202 - Dongle for iPhone cpl. with IR and radio communication.	Apple iPod touch 4 iPhone 4G	All AUTO <sub>ADAPT</sub> pumps 98046376
		TM05 3887 1612 For Grundfos GO: MI 204 - Dongle for iPhone cpl. with IR and radio communication.	Apple iPod touch 5 iPhone 5	
8		TM05 3890 1612 For Grundfos GO: MI301 - module with built-in IR and radio communication. It must be used in conjunction with an Android or iOS-based Smartphone with Bluetooth connection.	-	All AUTO <sub>ADAPT</sub> pumps 98046408
9		TM05 7471 1013 GENibus communication* Grundfos GO	CIU 902	All AUTO <sub>ADAPT</sub> pumps 97644690
		TM05 7471 1013 Profibus communication Profibus DP + Grundfos GO	CIU 152	All AUTO <sub>ADAPT</sub> pumps 98128063
		TM05 7471 1013 Modbus RTU + Grundfos GO	CIU 202	All AUTO <sub>ADAPT</sub> pumps 97644728
		TM05 7471 1013 GSM / GPRS / SMS (e.g. for SCADA) + Grundfos GO	CIU 252	All AUTO <sub>ADAPT</sub> pumps 98347271
		TM05 7471 1013 Grundfos Remote Management (GRM) + Grundfos GO	CIU 272	All AUTO <sub>ADAPT</sub> pumps 97644730
		TM05 7471 1013 PROFIBUS IO + Grundfos GO / MODBUS TCP + Grundfos GO / BACNET IP + Grundfos GO / GRM IP + Grundfos GO	CIU 902 + CIM 500	All AUTO <sub>ADAPT</sub> pumps 97644690 + 98301408
		TM05 7431 1013		

No	Product	Description	DP / EF / SL1 / SLV	Product number
9		TM05 7471 1013 Radio Communication + Grundfos GO	All AUTO <sub>ADAPT</sub> pumps	CIU 902 + CIM 060  97644690 + 98778356
		TM06 2190 3714 External antenna for CIM 060 (optional)		
		AUTO <sub>ADAPT</sub> fuse box, 1 pump without space for CIU AUTO <sub>ADAPT</sub> fuse box, 1 pump with space for CIU AUTO <sub>ADAPT</sub> fuse box, 2 pumps without space for CIU AUTO <sub>ADAPT</sub> fuse box, 2 pumps with space for CIU Option AUTO <sub>ADAPT</sub> CIU 202 Modbus RTU** Option AUTO <sub>ADAPT</sub> CIU 272 GRM** Option AUTO <sub>ADAPT</sub> CIU 902** Option AUTO <sub>ADAPT</sub> CIU 252 GSM complete** Option AUTO <sub>ADAPT</sub> service plug 230 V* / 50 Hz** Option AUTO <sub>ADAPT</sub> plug PCtool Linkbox** Option AUTO <sub>ADAPT</sub> fault light mounted on top** Option AUTO <sub>ADAPT</sub> audio alarm, 100 dB**		All AUTO <sub>ADAPT</sub> pumps
98491149				
98491153				
98491155				
98492189				
98492205				
98492206				
98492207				
98492208				
98492209				
98492210				
98492211				

\* The modules are delivered as two parts and need to be built together.

\*\* Accessories for control box are to be ordered together.

## DP, EF, SL1 and SLV pumps

### Level controllers

Grundfos offers a wide range of pump controllers to keep a watchful eye on liquid levels in the wastewater collecting tank, ensuring correct operation and protection of the pumps.

Controller ranges:

- Dedicated Controls, DC and DCD control cabinets
- LC and LCD level controllers
- CU 100 control box.

The DC, LC and CU 100 are designed for one-pump installations, and the DCD and LCD are designed for two-pump installations.

### Dedicated Controls

Grundfos Dedicated Controls is a control system that can control and monitor one or two Grundfos wastewater pumps and a mixer or a flush valve.

Dedicated Controls is used in installations requiring advanced control and data communication.

Main components of the Dedicated Controls system:

- CU 362 control unit
- IO 351B module (general I/O module).

Dedicated Controls is available either as separate components or as control cabinets, i.e. DC and DCD.

The control system can be operated by the following:

- float switches
- a level sensor
- a level sensor and safety float switches.

The control cabinet is available for the following pump sizes and starting methods:

- pumps up to and including 9 kW, direct-on-line starting
- pumps up to and including 30 kW, star-delta starting
- pumps up to and including 30 kW, soft starter.

The separate control unit and modules can be built for practically any size of system.

The DC and DCD control cabinets can be fitted with various units:

- The CU 362 control unit, which is the "brain" of the Dedicated Controls system, is fitted in the cabinet front. The CU 362 can be fitted with one of the Grundfos CIM communication modules mentioned below, depending on the monitoring needs or the SCADA system:
  - The CIM 200 is a communication module used for the Modbus RTU fieldbus protocol.
  - The CIM 250 is a communication module used for GSM/GPRS communication. The CIM 250 establishes communication between the CU 362 and a SCADA system, thereby allowing the application to be monitored and controlled remotely. This module also offers SMS messaging, for example status and alarm messages.
  - The CIM 270 is a communication module for the Grundfos Remote Management system (GRM). The CIM 270 establishes communication between the CU 362 and the GRM, thereby allowing the application to be monitored and controlled remotely.
- The IO 351B module, which is a general I/O module. The IO 351B communicates with the CU 362 via GENIbus.
- The MP 204 motor protector (optional), which provides many electrical status values, for example voltage, current, power, insulation resistance and energy. The MP 204 offers better protection of the pumps than a conventional motor protection device.
- The CUE/VFD (optional), which is either a Grundfos variable-frequency converter or a general variable-frequency converter, also offers better pump protection and a more steady flow through the pit pipes, so the pumps are treated well and the energy consumption is kept at a minimum.

For further information, see the data booklet or installation and operating instructions for Dedicated Controls on [www.grundfos.com](http://www.grundfos.com) (Grundfos Product Center).



GrA6270

Fig. 46 Dedicated Controls control cabinet



**LC and LCD**

The Grundfos LC and LCD ranges of level controllers comprise three series with a total of six variants:

- LC and LCD 107 operated by air bells
- LC and LCD 108 operated by float switches
- LC and LCD 110 operated by electrodes.

All controllers are ideally suited for applications requiring up to 11 kW motors for direct-on-line starting. The LC and LCD can also be supplied with an integrated star-delta starter for applications requiring larger motors up to and including 30 kW.

**Features and benefits**

- Control of one pump (LC) or two pumps (LCD).
- Automatic alternating operation of two pumps (LCD).
- Automatic test run (prevents shaft seals from becoming jammed in the event of long periods of inactivity).
- Water hammer protection.
- Starting delay after power supply failure.
- Automatic alarm resetting, if required.
- Automatic restarting, if required.
- Alarm outputs as NO and NC.



TM04 2360 2408

**Fig. 47** LCD 110 for two-pump installations

When an SMS module (optional) is fitted in an LC or LCD controller, it acts as a time recorder for the pumps, and when programmed (using an ordinary mobile phone with text messaging facility), it can send text messages containing "high-level alarm", "general alarm", information about operation and the number of times the pump has started. The SMS module is also available with battery and can thus send text messages that will inform you of power failure and when the power has been restored.

For further information, see the data booklet or installation and operating instructions for the LC and LCD controllers on [www.grundfos.com](http://www.grundfos.com) (Grundfos Product Center).

**CU 100**

The CU 100 control box is designed for the starting, operation and protection of small wastewater pumps. The control box is available in several variants which can be used for the following:

- single-phase pumps (up to and including 9 A)
- three-phase pumps (up to and including 5 A) and
- start/stop by means of a float switch
- manual start/stop.

During manual operation, the pump is started and stopped with the on/off switch.

During automatic operation, the float switch will start and stop the pump.

For further information, see the installation and operating instructions for the CU 100 on [www.grundfos.com](http://www.grundfos.com) (Grundfos Product Center).



TM02 6459 0703

**Fig. 48** CU 100

### Grundfos CIU unit

The Grundfos CIU unit (CIU = Communication Interface Unit) is used as a communication interface between a Grundfos product and a main network.

The CIU unit is used as an interface for following:

- Configuration of pump parameters required for water level control.
- Online monitoring of pit and pump values.
- Manual water level control (forced start/stop).
- Obtaining of measured and logged data that is valuable for pump service and pit optimisation.

The CIU unit is designed for use together with Grundfos DP, EF, SL1 and SLV AUTO<sub>ADAPT</sub> pumps. Communication can be established with the Grundfos R100 remote control or by using the main network interface of the CIU unit.

Available CIU units:

- CIU 902 unit (without CIM module)
- CIU 202 Modbus unit
- CIU 252 GSM/GPRS unit
- CIU 272 GRM unit (Grundfos Remote Management).

The CIU unit incorporates one or two modules:

- Multi-purpose IO module with I/O functionality, IR communication interface and powerline communication.
- CIM 2XX module (optional).

For further information about the CIM module fitted, see installation and operating instructions for the relevant CIM module.

If a CIM module is fitted in the CIU unit, the sensors connected to the digital input of the IO module can be remotely monitored from a centrally located SCADA system.

### Grundfos GO remote control

The Grundfos GO remote control is designed for wireless IR communication with Grundfos products.

Grundfos GO can communicate with the DP, EF, SL1 and SLV AUTO<sub>ADAPT</sub> pumps via a CIU unit.

Grundfos GO is to be regarded as an ordinary service and measuring tool and is therefore designed to withstand wear and stress from everyday use.

### Grundfos fuse box

The fuse box is designed to provide a safe power supply for up to two Grundfos AUTO<sub>ADAPT</sub> pumps in the range of 0.9 to 4.0 kW.

Furthermore, the fuse box enables communication with following devices:

- Grundfos Remote Management (GRM)
- Grundfos GO
- SCADA.



Fig. 49 Grundfos fuse box

TM04 4443 2215

Name	DC	DCD	LC	LCD	CU 100	AUTO <sub>ADAPT</sub>	CIU
<b>Application</b>							
One pump	•	•	•	•	•	•	•
Two pumps		•		•		•	•
Mixer	•	•					
Battery back-up	•	•					
<b>Level sensor</b>							
Float switches	•	•	•	•	•		• <sup>7)</sup>
Electrodes			•	•			• <sup>7)</sup>
Air bells			•	•			• <sup>7)</sup>
Pressure sensor	•	•				• <sup>3)</sup>	• <sup>7)</sup>
Ultrasonic sensor	•	•					• <sup>7)</sup>
Analog level sensor with safety float switches	•	•					• <sup>7)</sup>
<b>Starting method</b>							
Direct-on-line starting (DOL)	•	•	•	•	•	•	•
Star-delta starting	•	•	•	•			
Soft starter	•	•					
<b>Basic functions</b>							
Start and stop of pump(s)	•	•	•	•	•	•	•
Pump alternation		•		•		•	•
High-level alarm	•	•	•	•		•	•
Dry-running level alarm	•	•	•	•		•	•
Flow measurement (calculated or via flow sensor)	•	•					
Pump statistics	•	•				• <sup>4)</sup>	•
Conflicting levels alarm	•	•					
<b>Advanced functions</b>							
Start and stop delays	•	•	•	•		•	•
Motor temperature sensor	•	•	•	•		• <sup>4)</sup>	•
Test run/anti-seizing	•	•	•	•		•	•
Daily emptying (emptying the pit once a day)	•	•					•
Water-in-oil sensor input	•	•					
<b>Communication</b>							
SMS messaging	• <sup>2)</sup>	• <sup>2)</sup>	• <sup>1)</sup>	• <sup>1)</sup>			• <sup>2)</sup>
SCADA communication (GSM/GPRS)	• <sup>2)</sup>	• <sup>2)</sup>					• <sup>5)</sup>
<b>User interface</b>							
Level indication	•	•	•	•			• <sup>6)</sup>
Graphical display	•	•					• <sup>6)</sup>
PC Tool WW Controls	•	•				•	

<sup>1)</sup> If an SMS module is fitted.

<sup>2)</sup> If a CIM 250 GSM/GPRS module is fitted in the CU 362.

<sup>3)</sup> Built-in pressure sensor and dry-running sensor.

<sup>4)</sup> Built-in, but a Grundfos CIU unit is required to get access to data or setting of parameters.

<sup>5)</sup> Modbus, GSM, GPRS, SMS and GRM options.

<sup>6)</sup> When using a Grundfos GO remote control.

<sup>7)</sup> Inputs for external sensors (NO or NC).

## 13. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

<http://product-selection.grundfos.com>



"SIZING" enables you to size a pump based on entered data and selection choices.

"REPLACEMENT" enables you to find a replacement product. Search results will include information on the following:

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.

The screenshot shows the Grundfos Product Center website. At the top, there is a navigation bar with the logo and menu items: HOME, FIND PRODUCT, COMPARE, YOUR PROJECTS, SAVED ITEMS, HELP. Below this is a search bar with a 'SEARCH' button. The main content area features four large buttons: SIZING (Enter pump sizing), CATALOGUE (Products and services), REPLACEMENT (Replace an old pump with a new), and LIQUIDS (Find pump by liquid). Below these is a 'QUICK SIZING' section with input fields for 'Flow (Q)\*' (m³/h) and 'Head (H)\*' (m), and radio buttons for 'Select what to size by': Size by application, Size by pump design, and Size by pump family. A 'START SIZING' button is also present. At the bottom, there are options for 'ADVANCED SIZING' with checkboxes for 'Advanced sizing by application' and 'Guided selection'.

"CATALOGUE" gives you access to the Grundfos product catalogue.

"LIQUIDS" enables you to find pumps designed for aggressive, flammable or other special liquids.

### All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

### Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc. in PDF format.

Subject to alterations.







be think innovate

---

97655139 0717

ECM: 1212811

**GRUNDFOS A/S**  
DK-8850 Bjerringbro . Denmark  
Telephone: +45 87 50 14 00  
[www.grundfos.com](http://www.grundfos.com)

**GRUNDFOS** 

The name Grundfos, the Grundfos logo, and be think innovate are registered trademarks owned by Grundfos Holding A/S or Grundfos A/S, Denmark. All rights reserved worldwide. © Copyright Grundfos Holding A/S