Technical Specification

886133_5.0

Concertor™

N/EA/DP

FLYGT

POMPDIRECT

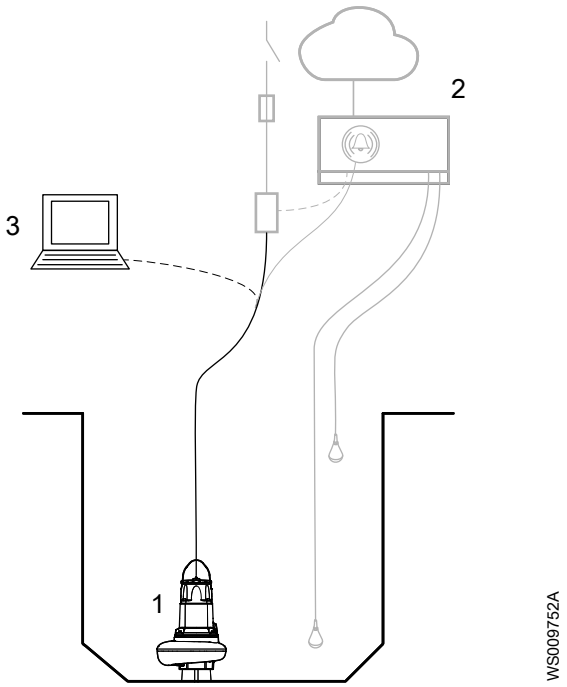
Table of Contents

1 System Description

1.1 System overview

Concertor™ is a wastewater pumping system with integrated intelligent technology.

1.1.1 Concertor™ N



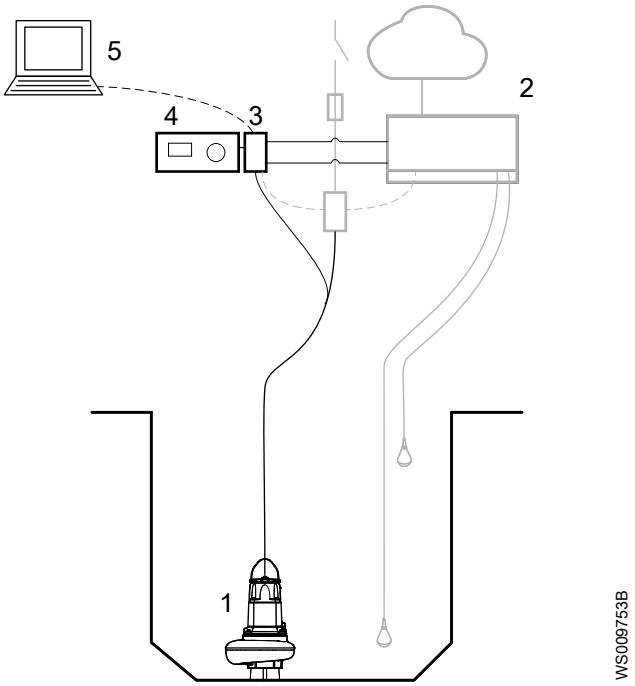
Parts

Number	Part	Description
1	Pump	A pump in the Concertor™ N system series.
2	Components outside of the Concertor™ system	• Contactors, fuses, relays • Controller / RTU / PLC • Level sensors • Cloud services • Pump sum-alarm I/O
3	PC application	Dirigo™ Service Tool gives access to settings and log files. Connection is made through cable leads T3 and T4.

Functions

- Pump clog detection
- Pump cleaning
- Soft-start
- Constant power
- Always correct rotation
- Pump sum-alarm I/O
- Change pump performance, Dirigo™ Service Tool

1.1.2 Concertor™ EA



Parts

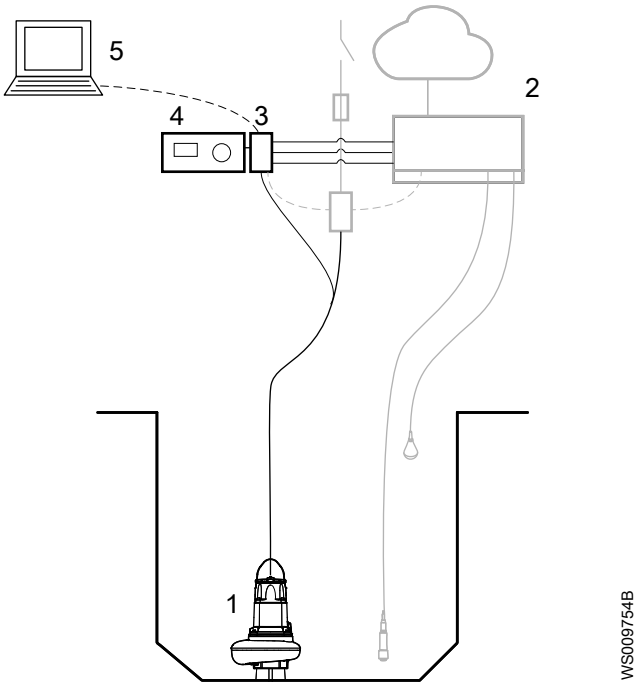
Number	Part	Description
1	Pump	A pump in the Concertor™ N system series.
2	Components outside of the Concertor™ system	• Contactors, fuses, relays • Controller / RTU / PLC • Level sensors • Cloud services • Pump sum-alarm I/O
3	Gateway, FPG 411	• The gateway starts and stops the pump based on the input signal from the external control system. – Digital input signal – Modbus • All the alarms are sent back to the external control system. • The operator changes the pump settings through the gateway. • Data is logged by and stored in the gateway.
4	HMI, FOP 312	The HMI is handheld, or mounted inside the cabinet or in the cabinet door. The HMI is optional.
5	Embedded web server	The embedded web server is an alternative interface with access to the same menu system as the HMI.

Functions

- Pump clog detection
- Pump cleaning
- Soft-start
- Soft-stop
- Constant power
- Always correct rotation
- Set-up wizard from HMI or webserver
- Set pump performance (pump stopped)
- Pump alarms with priority A or B, through I/O

- Pump and motor control alarms, HMI or Modbus
- Alarm handling
- Status and alarm history

1.1.3 Concertor™ DP



Parts

Number	Part	Description
1	Pump	A pump in the Concertor™ N system series.
2	Components outside of the Concertor™ system	• Contactors, fuses, relays • Controller / RTU / PLC • Level sensors or flow meters • Cloud services • Pump sum-alarm I/O
3	Gateway, FPG 412	• The gateway starts and stops the pump based on the input signal from the external control system. – Digital input signal – Analog input signal – Modbus • All the alarms are sent back to the external control system. • The operator changes the pump settings through the gateway. • Data is logged by and stored in the gateway.
4	HMI, FOP 312	The HMI is handheld, or mounted inside the cabinet or in the cabinet door. The HMI is optional.
5	Embedded web server	The embedded web server is an alternative interface with access to the same menu system as the HMI.

Functions

- External process control for dynamic pump performance, 4–20 mA or Modbus
- Pump clog detection
- Pump cleaning
- Soft-start

- Soft-stop
- Constant power
- Always correct rotation
- Set-up wizard from HMI or webserver
- Pump alarms with priority A or B, through I/O
- Pump and motor control alarms, HMI or Modbus
- Alarm handling
- Status and alarm history

2 Product Description

2.1 N-pump

Product design

Concertor™ pumps, with integrated intelligent control system, are designed for sustained high efficiency, with four different motor ratings. Applications range from wastewater containing solids or long-fibered material, to clean water and surface water. Concertor™ pumps are suitable for customers who want to benefit from easily adjustable pump performance, clog detection, and pump cleaning function. Other features and functionality are added depending on the selected offer. For more information, see the system description.

Impeller material

- Gray iron
- Hard-Iron™
- Stainless steel

Discharge connection (pressure class)

- 150 (LT)
- 100 (MT)
- 80 (HT)

Installation types

The pump can be used in the following installations:

P Semipermanent, wet well arrangement with the pump installed on two guide bars. The connection to the discharge is automatic.

S Portable semipermanent, wet well arrangement with hose coupling or flange for connection to the discharge pipeline.

T Vertical permanent, dry well arrangement with flange connection to the suction and discharge piping.

Z Horizontal permanent, dry well arrangement with flange connection to the suction and discharge piping.

Products included

Product	Approvals
6020.180	Standard
6020.090	Ex-approved

Illustrations

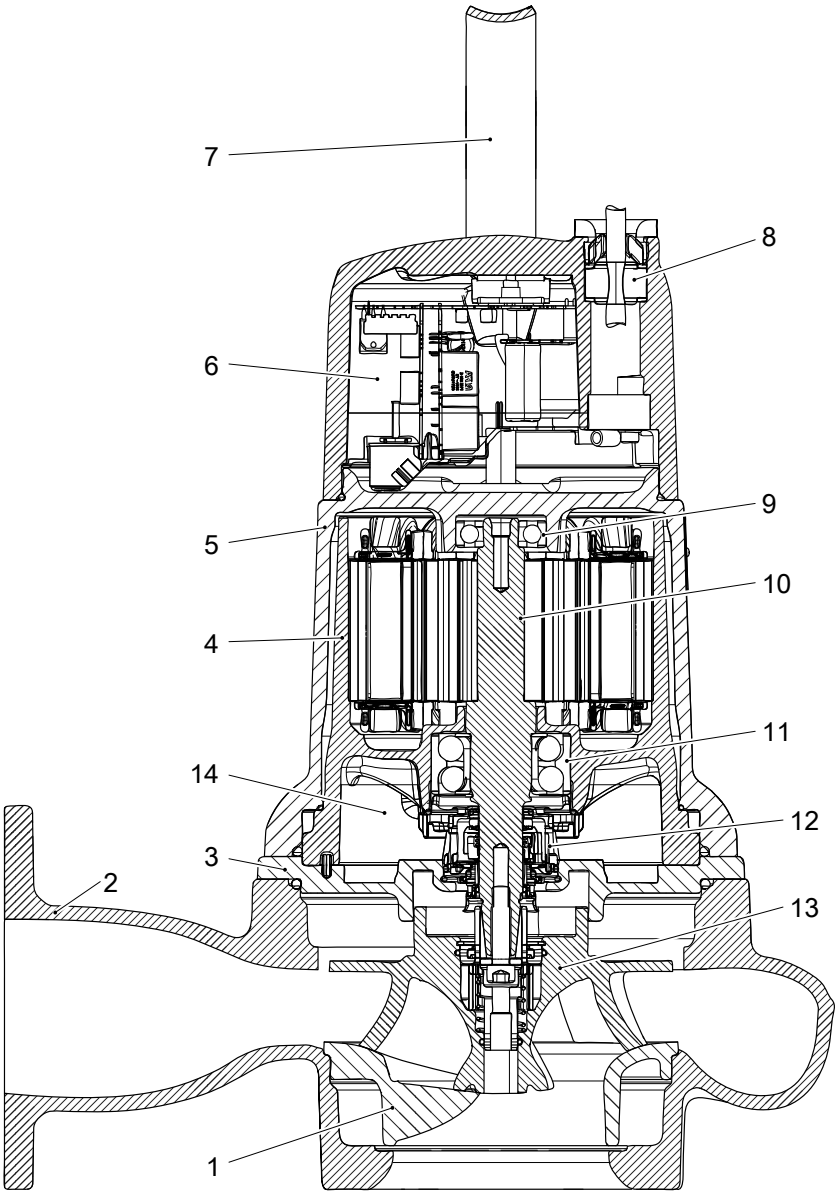


Figure 1: Outer casing of drive unit: Gray iron

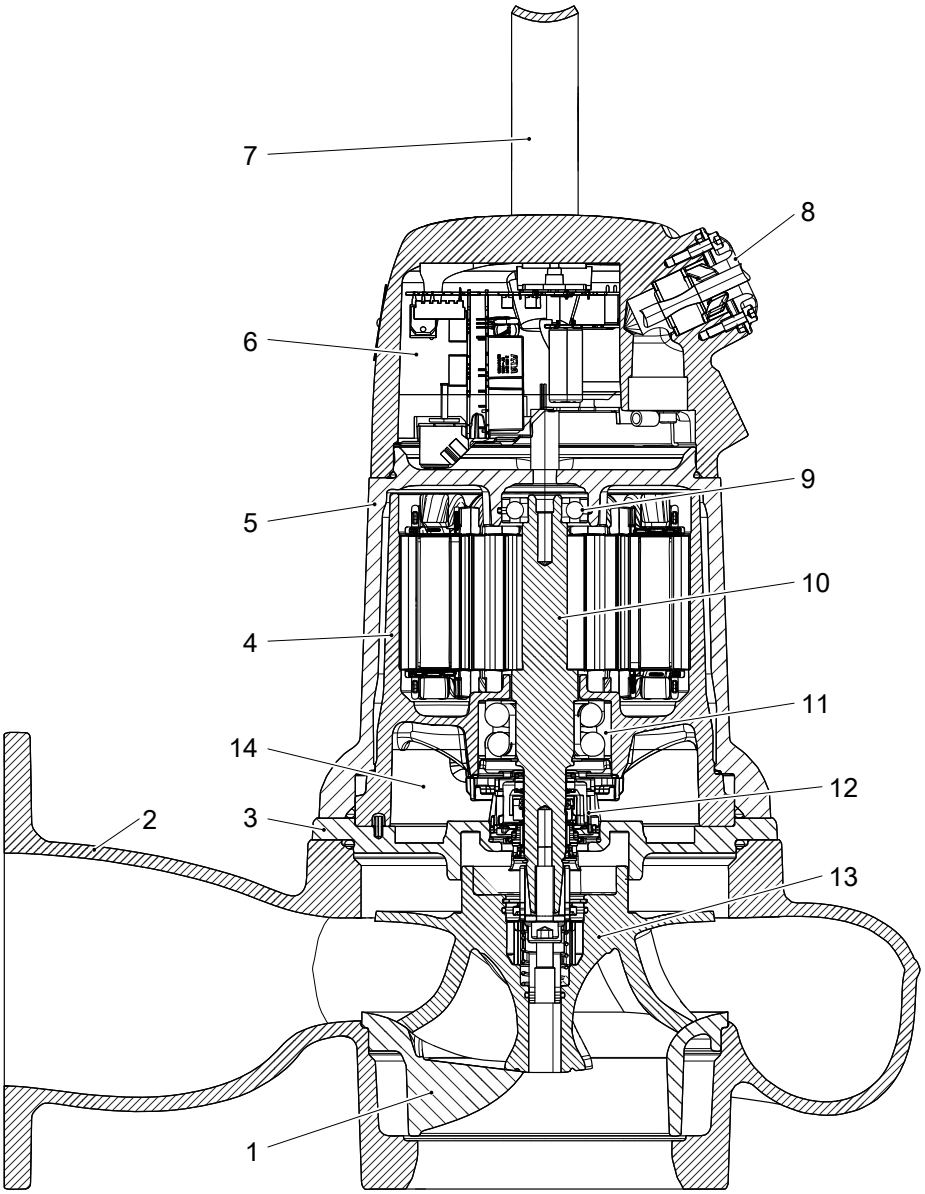


Figure 2: Outer casing of drive unit: Aluminum

Parts

Position	Part
1	Insert ring with a guide pin
2	Pump housing, without flush valve connection
3	Seal housing cover
4	Stator housing unit with a leakage sensor
5	Cooling jacket / outer casing
6	Connection housing with integrated control system
7	Lifting handle
8	Cable entry
9	Support bearing
10	Shaft unit with a permanent magnet rotor
11	Main bearing

Position	Part
12	Mechanical seal Plug in seal with active seal design.
13	Adaptive-N impeller
14	Oil

2.1.1 Cables

Screened Flygt SUBCAB® - a heavy duty 4 screened cores motor power cable with four twisted pair screened control cores. Conductor insulation rating of 90°C, which allows for increased current. Superior mechanical strength and high abrasion and tear resistant. Chemical resistant within pH 3-10 and ozone, oil, and flame resistant. Used up to 70°C water temperature.

2.1.2 Monitoring equipment

- Leakage sensor in the stator housing (FLS)
- Overtemperature sensors in the control system

Explosion-proof version: The stator incorporates three thermal contacts connected in series.

2.1.3 Options

- Surface treatment (Epoxy)
- Zinc anodes

2.1.4 Accessories

Example of accessories.

Item	Description
Pump controllers	FGC 400, MultiSmart, MyConnect
HMI	FOP 312
Monitoring relays	Supplied locally
Level sensors	LTU, ENM 10
SCADA systems	AquaView
Flow meters	MagFlux

Discharge connections, adapters, hose connections, and other mechanical accessories

2.2 FPG 411, FPG 412

2.2.1 Product design

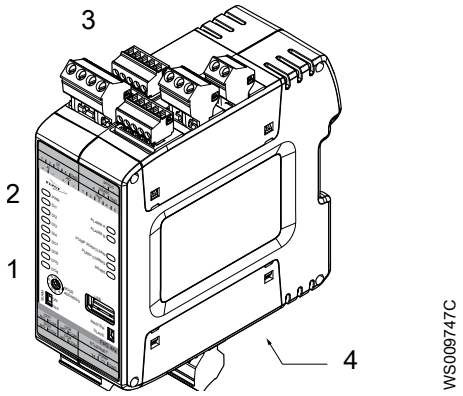
The products are part of the Concertor™ system. The gateways are connected to Flygt pumps 6020.180 or 6020.090. The gateway starts and stops the pump based on the input signal from the external control system. All the alarms are sent back to the external control system. Data is logged by and stored in the gateway.

Product name	Part number	Description
FPG 411	8012100	Gateway for Concertor™ EA. The pump performance is easily adjustable when the pump is stopped.
FPG 412	8012000	Gateway for Concertor™ DP. Dynamic pump performance change, through 4–20 mA or Modbus.

2.2.2 Approvals

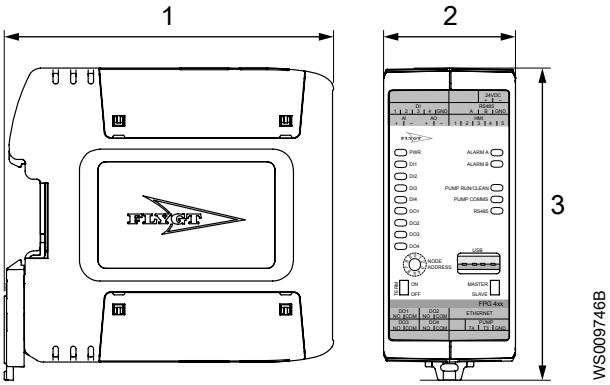
- CE
- UL
- CSA
- RCM

2.2.3 Parts



1. Front connections
2. Status LEDs
3. Top connections
4. Bottom connections

2.2.4 Dimensions



1. 112 mm (4.4 in)
2. 45 mm (1.8 in)
3. 106 mm (4.2 in)

3 Technical Reference

3.1 N-pump

3.1.1 Motor data

The drive unit includes a synchronous motor with IE4 equivalent efficiency.

NOTICE:
Do not connect a starter or a Variable Frequency Drive (VFD) to this unit.

Feature	Description
Input frequency	50–60 Hz
Input supply	3-phase • 380–480 V • 200–240 V
Maximum starts per hour	Concertor™ N: 60 Concertor™ EA, Concertor™ DP: 240
Design in applicable parts	According to IEC 60034–1
Voltage variation	• Continuously running: Maximum ±5% • Intermittently running: Maximum ±10%
Voltage imbalance between the phases	Maximum of 2%
Stator insulation class	In accordance with class H (180°C, 356°F)

3.1.2 Application limits

Data	Description
Liquid temperature	Maximum 40°C (104°F)
Liquid density	Maximum 1100 kg/m3 (9.2 lb per US gal)
pH of the pumped liquid	5.5–14
Depth of immersion	Maximum 20 m (65 ft)

3.1.3 Materials

Table 1: Major parts except mechanical seals

Denomination	Material	ASTM	EN
Major castings	Cast iron, gray	35B	GJL-250
Cooling jacket, alternative 1	Cast iron, gray	35B	GJL-250
Cooling jacket, alternative 2	Aluminum	H5202-86-AC4A	1706:AC-43100+43000
Pump housing	Cast iron, gray	35B	GJL-250
Impeller, alternative 1	Cast iron, gray	35B	GJL-250
Impeller, alternative 2	Cast iron, Hard-Iron™	A 532 IIIA	GJN-HB555(XCR23)
Impeller, alternative 3	Stainless steel, Duplex	CD-4MCuN	10283:1.4474
Insert ring, alternative 1	Cast iron, gray	35B	GJL-250
Insert ring, alternative 2	Cast iron, Hard-Iron™	A 532 IIIA	GJN-HB555(XCR23)
Lifting handle	Stainless steel	AISI 316L	1.4404,1.4432, …
Shaft	Stainless steel	AISI 431	1.4057+QT800
Screws and nuts	Stainless steel, A4	AISI 316L, 316, 316Ti	1.4401,1.4404, …

Denomination	Material	ASTM	EN
O-rings	Nitrile rubber (NBR) 70° IRH	-	-
Oil	A medical white oil of paraffin type that fulfills FDA 172.878 (a) and viscosity close to VG32.	-	-

Table 2: Mechanical seals

Alternative	Inner seal	Outer seal
1	Corrosion resistant cemented carbide (WCCR)/ Corrosion resistant cemented carbide (WCCR)	Corrosion resistant cemented carbide (WCCR)/ Corrosion resistant cemented carbide (WCCR)
2	Corrosion resistant cemented carbide (WCCR)/ Corrosion resistant cemented carbide (WCCR)	Silicon carbide (RSiC)/ Silicon carbide (RSiC)

3.1.4 Surface treatment

Priming	Finish
Painted with a primer, see internal standard M0700.00.0002	Navy gray color NCS 5804-B07G. Two-component high-solid top coating, see internal standard M0700.00.0004 for standard painting and M0700.00.0008 for special painting.

3.2 FPG 411, FPG 412

3.2.1 Environmental requirements

Parameter	Value
Operating temperature	-20°C – +65°C (-4°F – 149°F)
Storage temperature	-20°C – +70°C (-4°F – 158°F)
Operating humidity	Relative humidity, non-condensing: 5 – 95%
Sunlight exposure	UV-resistant
Maximum altitude	• With UL approval: Maximum 2000 m (6562 ft) • Without UL approval: 4000 m (13 123 ft)

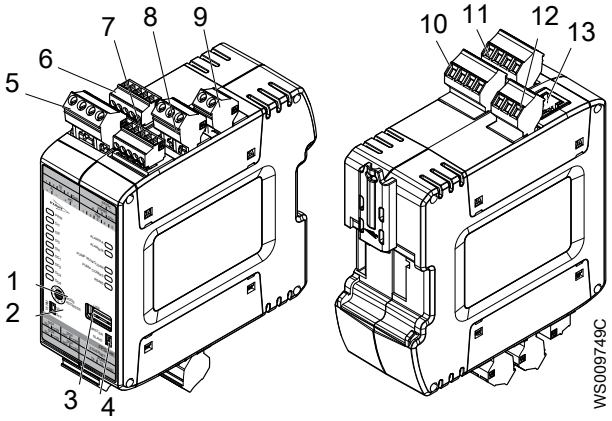
3.2.2 IP-rating

IP20

3.2.3 Electrical data

Parameter	Value
Supply voltage	+ 24 VDC
Supply voltage tolerance	± 10%
Current consumption	< 700 mA. Typical: 150 mA

3.2.4 Terminals



Section	Terminal		Description
1	NODE ADDRESS		Node address 0–9, rotary switch. 0 is not used.
2	TERM		120 ohm termination on or off switch. Always ON
3	USB		Standard type A USB socket
4	MASTER, SLAVE		Not applicable
5	+	AI	Isolated analog input, 4–20 mA Maximum 24 VDC Not applicable for FPG 411
	–		
	+	AO	Analog output, 4–20 mA Maximum 24 VDC
	–		
6	1	DI	1–4: Digital inputs GND: Common ground (earth) Maximum 24 VDC
	2		
	3		
	4		
	GND		
7	1	HMI	Flygt FOP 312 1: Ground 2: CAN low 3: Shield 4: CAN high 5: + 24 VDC output
	2		
	3		
	4		
	5		
8	A	RS485	RS-485 Modbus slave
	B		
	GND		
9	+	24 VDC	24 VDC ±10% The power supply unit must fulfill isolation class II. < 700 mA. Typical: 150 mA Fuse: 1 A
	–		

Section	Terminal		Description
10	NO	DO3	Potential free relay output Maximum 250 VAC, or 30 VDC, 5 A External fuse required, 5 A
	COM		
	NO	DO4	Potential free relay output Maximum 250 VAC, or 30 VDC, 5 A External fuse required, 5 A
	COM		
11	NO	DO1	Potential free relay output Maximum 250 VAC, or 30 VDC, 5 A External fuse required, 5 A
	COM		
	NO	DO2	Potential free relay output Maximum 250 VAC, or 30 VDC, 5 A External fuse required, 5 A
	COM		
12	T4	PUMP	Pump interface RS-485 Not used: GND
	T3		
	GND		
13	–		Ethernet

4 Motor Rating and Performance Curves

4.1 Motor rating

380–480 V

Rated power (kW)	Rated power (Hp)	Voltage (V) / Rated current (A)	Voltage (V) / Starting current (A)	Power factor	Installation
7.3	10.0	380/13.1 - 480/10.4	380/13.1 - 480/10.4	0.95	P, S
5.5	7.5	380/10.0 - 480/7.9	380/10.0 - 480/7.9	0.95	P, S, T, Z
4.0	5.5	380/7.5 - 480/5.9	380/7.5 - 480/5.9	0.94	P, S, T, Z
2.2	3.0	380/4.6 - 480/3.7	380/4.6 - 480/3.7	0.91	P, S, T, Z

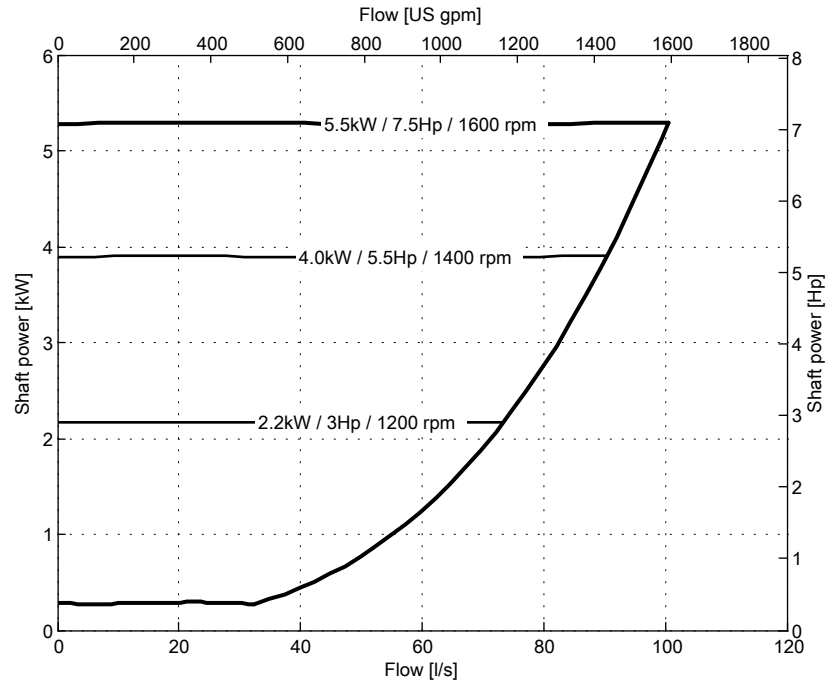
200–240 V

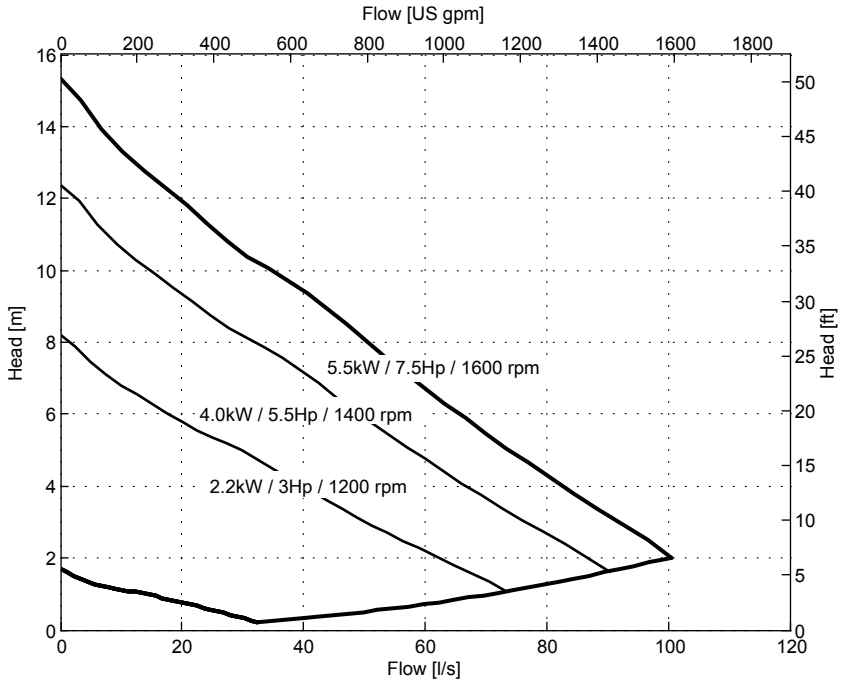
Rated power (kW)	Rated power (Hp)	Voltage (V) / Rated current (A)	Voltage (V) / Starting current (A)	Power factor	Installation
4.0	5.5	200/14 - 240/11.7	200/14 - 240/11.7	0.95	P, S, T, Z
2.2	3.0	200/7.3 - 240/6.1	200/7.3 - 240/6.1	0.95	P, S, T, Z

4.2 Performance curves

150 (LT)

The image shows the available field of operation, and maximum revolutions per minute (rpm) for each rated power value.

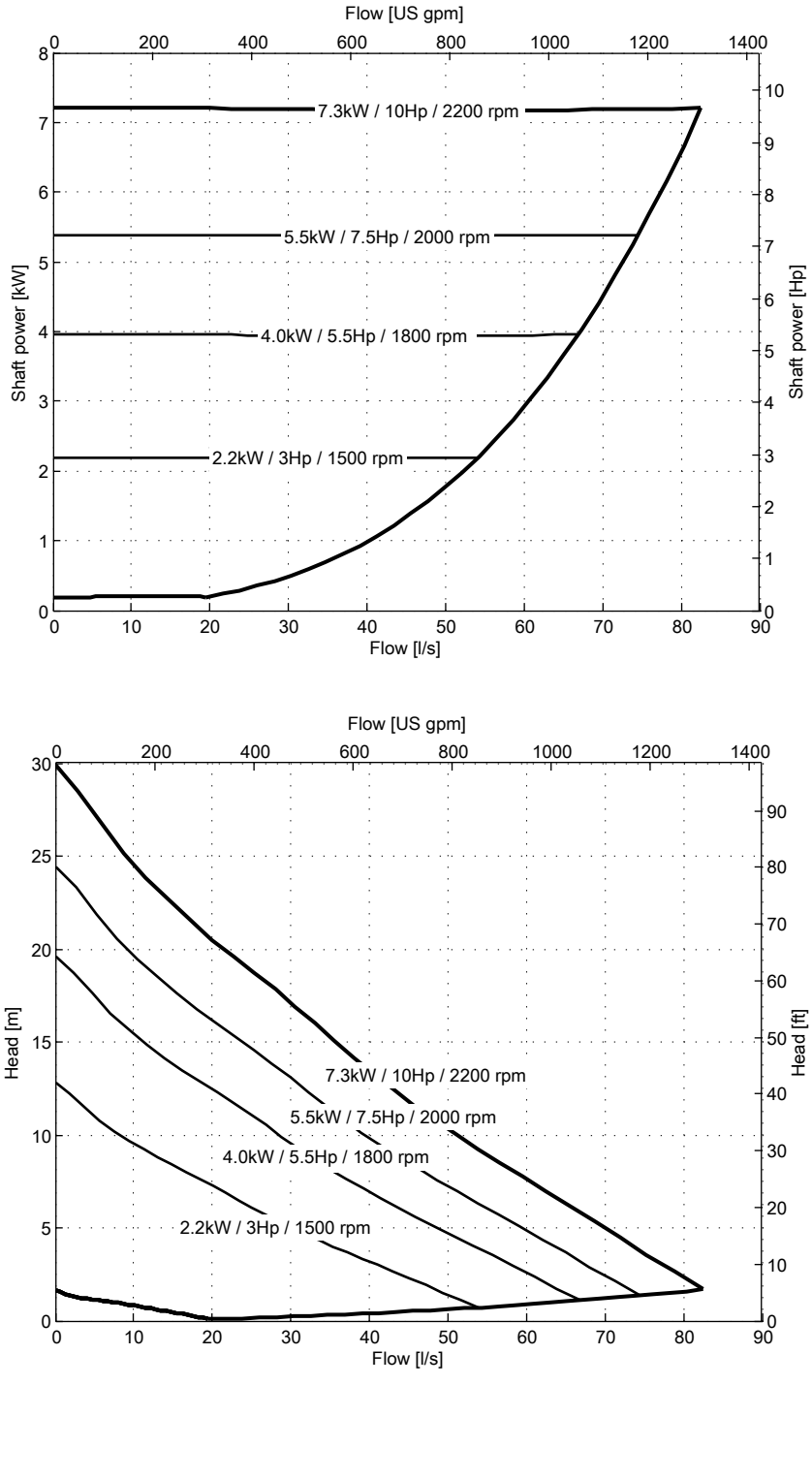




WS010000B

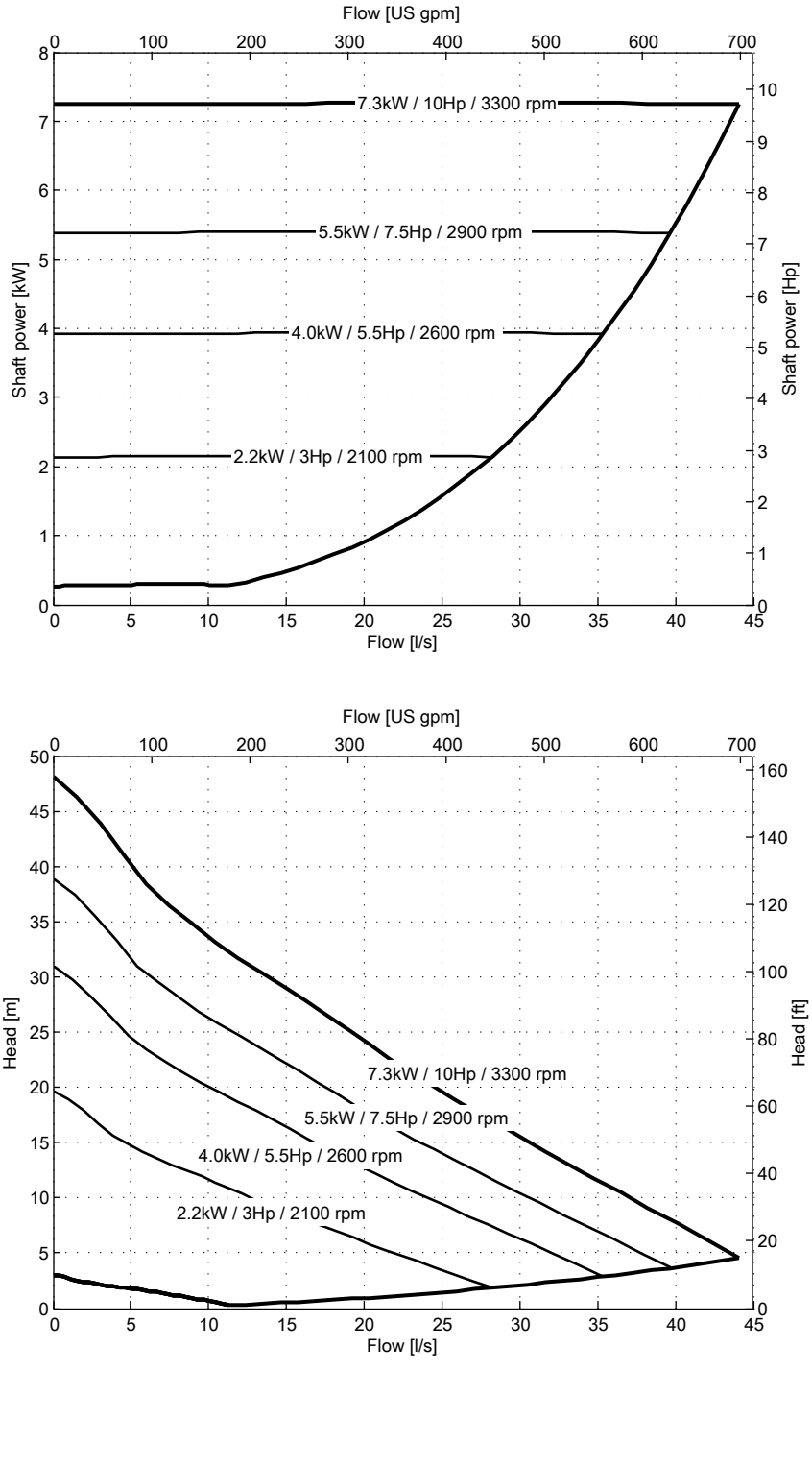
100 (MT)

The image shows the available field of operation, and maximum revolutions per minute (rpm) for each rated power value.



80 (HT)

The image shows the available field of operation, and maximum revolutions per minute (rpm) for each rated power value.



5 Dimensions and Weight

5.1 Drawings

All drawings are available as Acrobat documents (.pdf) and AutoCad drawings (.dwg). Contact a local sales and service representative for more information.

Drawings are found on Xylect or on TPI. *public.xylemwatersolutions.com/TPI_WS/TPIUK/Dimensionaldrawing.asp*

All dimensions are in mm.

Drawing number	Discharge connection	Installation
803 39 00	80 (HT)	P
803 40 00	150 (LT)	P
803 41 00	100 (MT)	P
803 42 00	80 (HT)	S
803 43 00	80 (HT), threaded	S
803 44 00	150 (LT)	S
803 45 00	150 (LT), threaded	S
803 46 00	100 (MT)	S
803 47 00	100 (MT), threaded	S
814 76 00	100/80 (HT)	X
814 77 00	150/100 (MT)	X
814 78 00	150/150 (LT)	X
813 89 00	80 (HT)	T
813 89 01	80 (HT), adapter	T
813 90 00	100 (MT), inlet 150	T
813 90 01	100 (MT), inlet 150, adapter	T
813 91 00	100 (MT), inlet 200	T
813 91 01	100 (MT), inlet 200, adapter	T
813 92 00	150 (LT), inlet 200	T
813 92 01	150 (LT), inlet 200, adapter	T
813 86 00	80 (HT)	Z
813 86 01	80 (HT), with service cart	Z
813 87 00	100 (MT)	Z
813 87 01	100 (MT), with service cart	Z
813 88 00	150 (LT)	Z
813 88 01	150 (LT), with service cart	Z

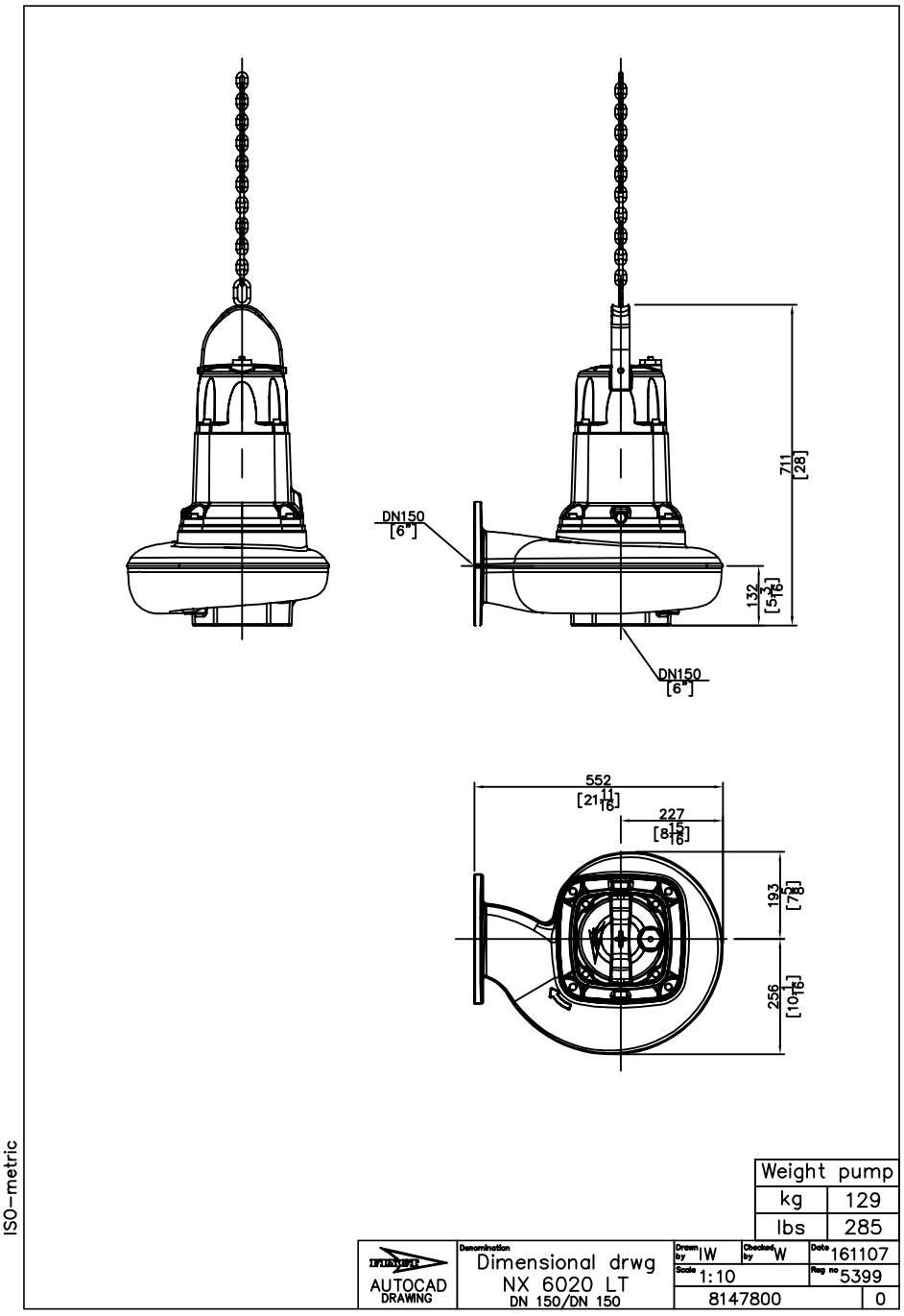


Figure 3: DN 150 (LT)

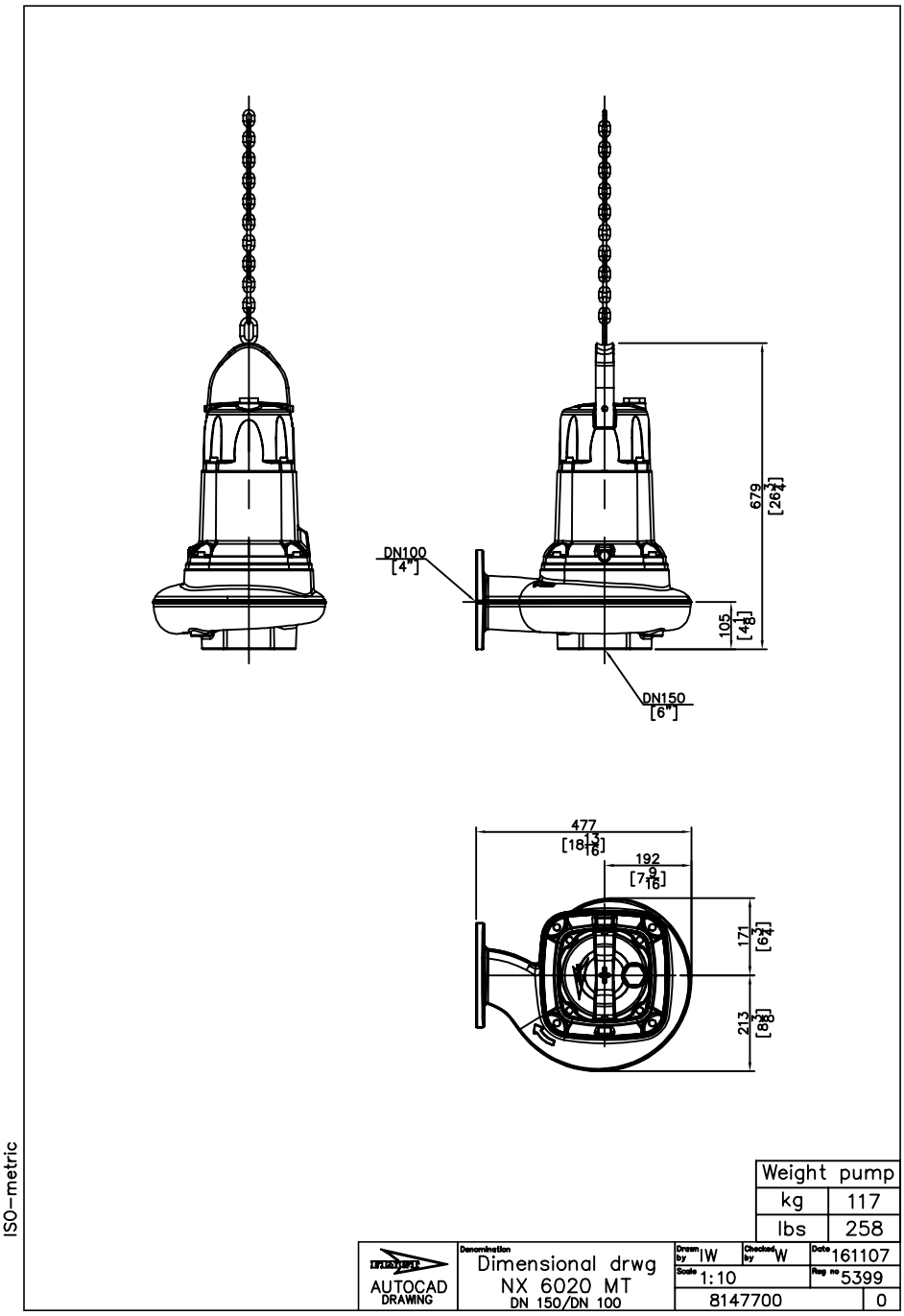


Figure 4: DN 100 (MT)

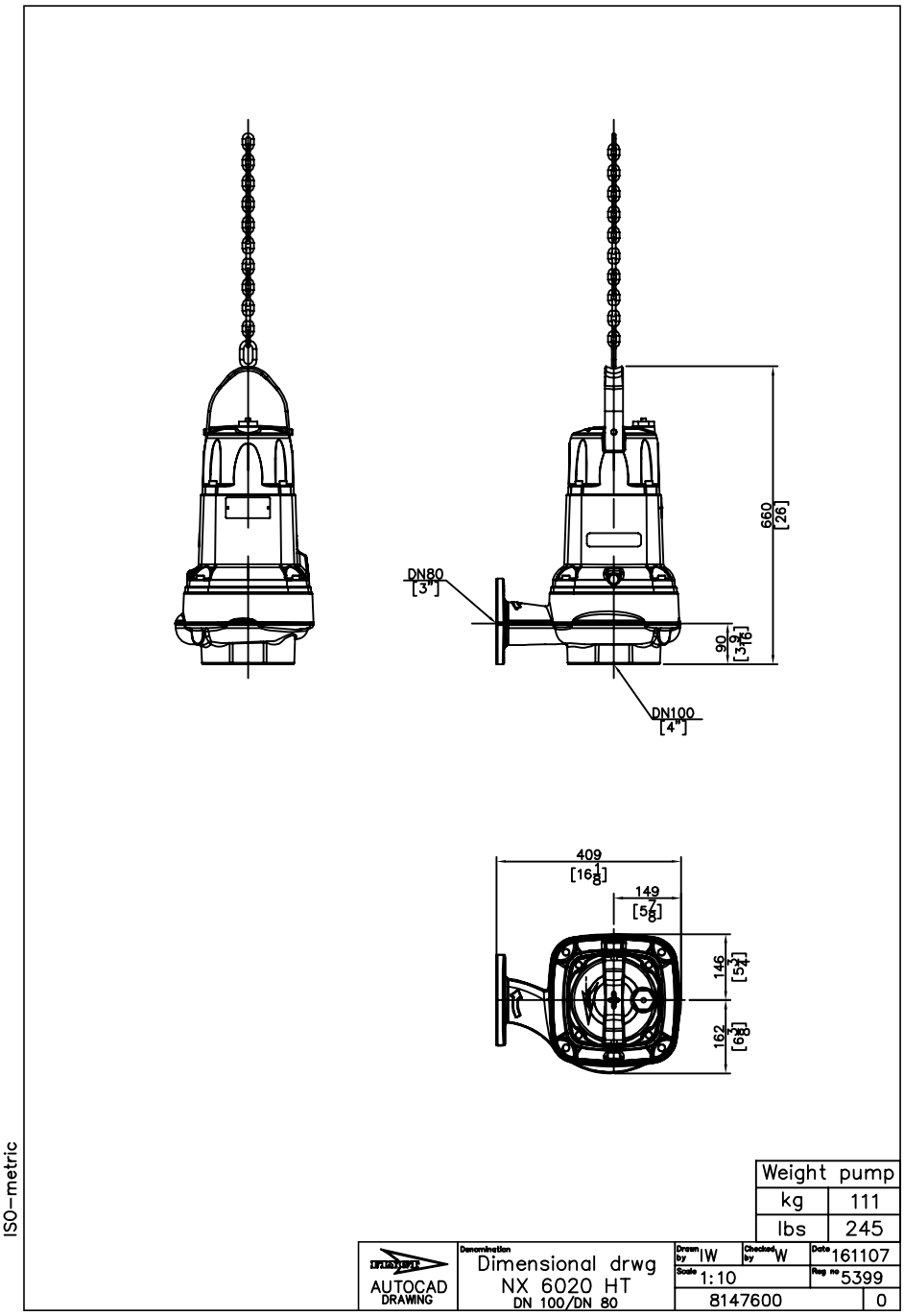


Figure 5: DN 80 (HT)