



DMLV

Submersible Vortex Pumps



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Features and Applications

Model **DMLV****■ Features**

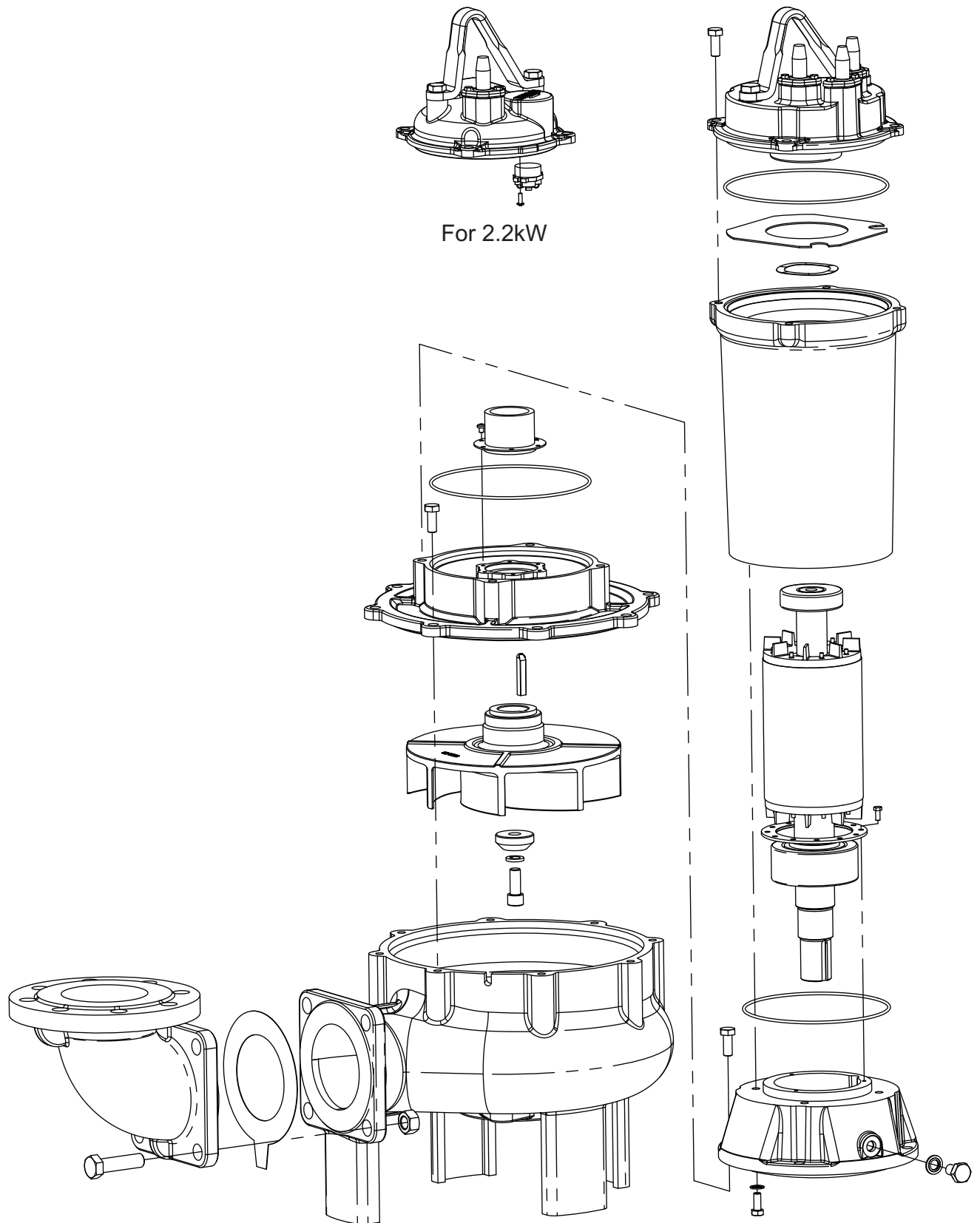
- **Free Flow Vortex Impeller.**
Vortex Impeller design provides no clog operation, handling up to 100mm soft solids and up to 500mm fibrous lengths.
- **Robust construction**
Rugged cast iron construction, all fasteners of stainless steel and a 4 pole motor.
- **Double mechanical seal in oil chamber**
An oil lubricated double mechanical seal with lower faces of hard silicon carbide provides strong and reliable shaft sealing
- **Long life.**
Short overhung shaft, large bearings and high grade mechanical seal gives longer life.

■ Applications

- Sewage.
- Waste water.
- Storm water drainage

Typical Exploded View

Note: Actual construction may vary depending on individual model.

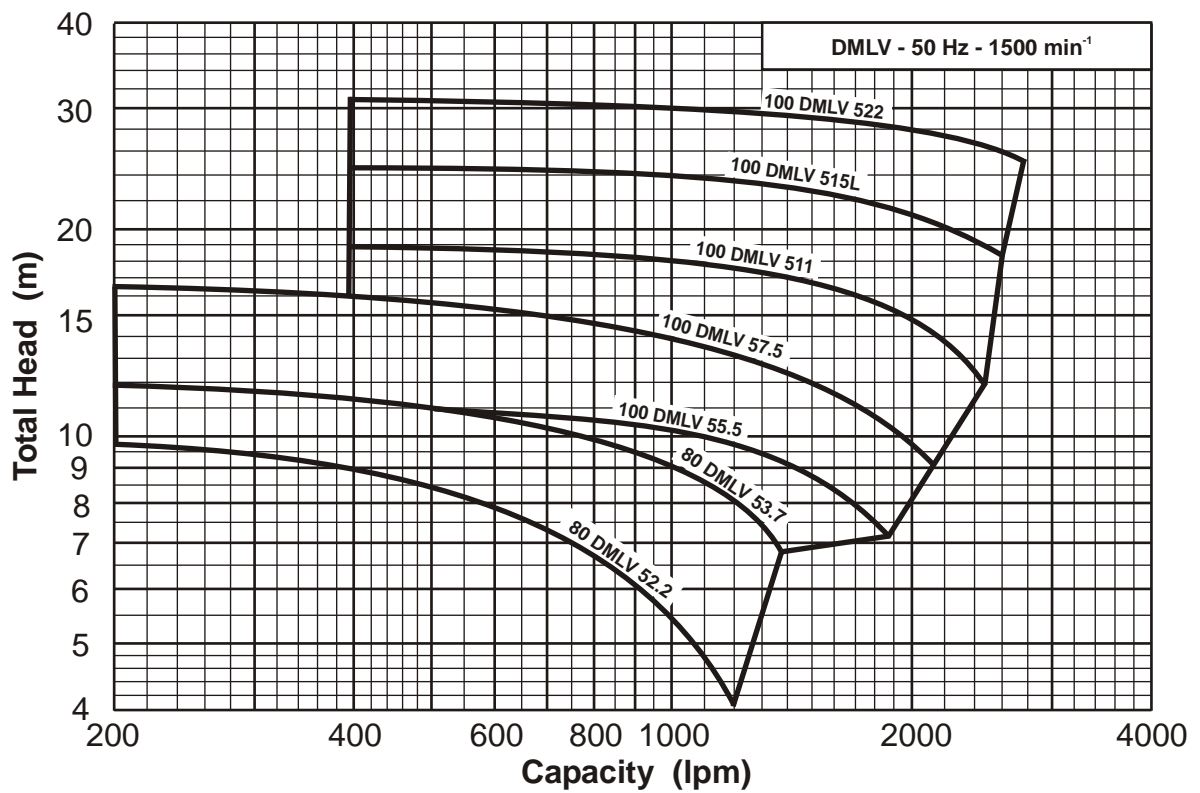


Specifications

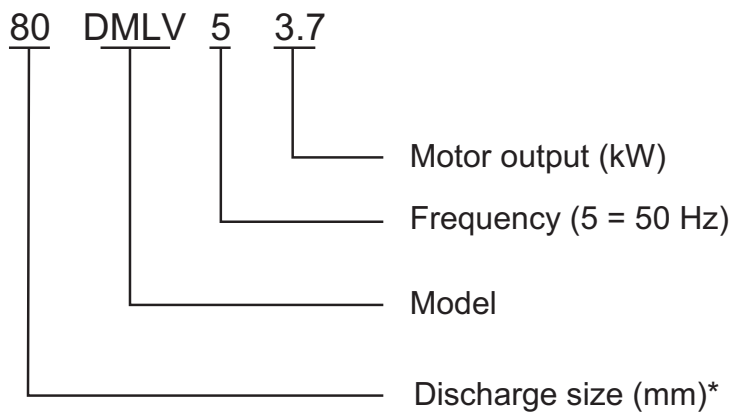
		Standard	Optional
Scope	Discharge	80 - 100 mm	
	Motor Power	2.2 - 22 kW (3ph.)	
	Performance	Capacity: 200 - 2800 lpm Head: 4 - 32m.	
Liquid	Type	Waste water, Sewage	
	Max. Temp.	40°C	
	Max. Solids	Refer to table below	
Submergence	Maximum	8 m.	
	Minimum	Refer to low water level (L.W.L) in dimensions.	
Construction	Impeller	Vortex	
	Mechanical Seal	Oil lubricated double mechanical seal, single spring.	
Materials	Casing	Cast Iron	
	Impeller	Cast Iron	
	Shaft	403 Stainless Steel	
	Motor Frame	Cast Iron	
	Fasteners	304 Stainless Steel	
	Mechanical Seal	Upper Faces: Carbon / Ceramic Lower Faces: Silicon Carbide / Silicon Carbide Lubricating Oil: Turbine oil VG32 (SAE 10W/20W)	
Motor	Type	Air filled dry submersible, IP58, Class F insulation.	
	Poles/Speed	4 pole / 1450 rpm	
	Applicable Voltages	380/400/415 Volt, 3 phase, 50 Hz	
	Starting	DOL (2.2 kW) Star-Delta (3.7 to 22 kW)	
	Protection	In built overload protection (2.2 kW) Miniature thermal protector (3.7 to 22 kW)	
	Bearings	Pre lubricated sealed ball bearings.	
Cable	Length	10 m.	
Accessories	Flange	Discharge elbow with screwed companion flange.	
			Quick Discharge Connector (QDC)

Solids Handling			
Max solids size	[mm]	80	(80DMLV)
		100	(100DMLV)
Max fibers length	[mm]	400	(80DMLV)
		500	(100DMLV)

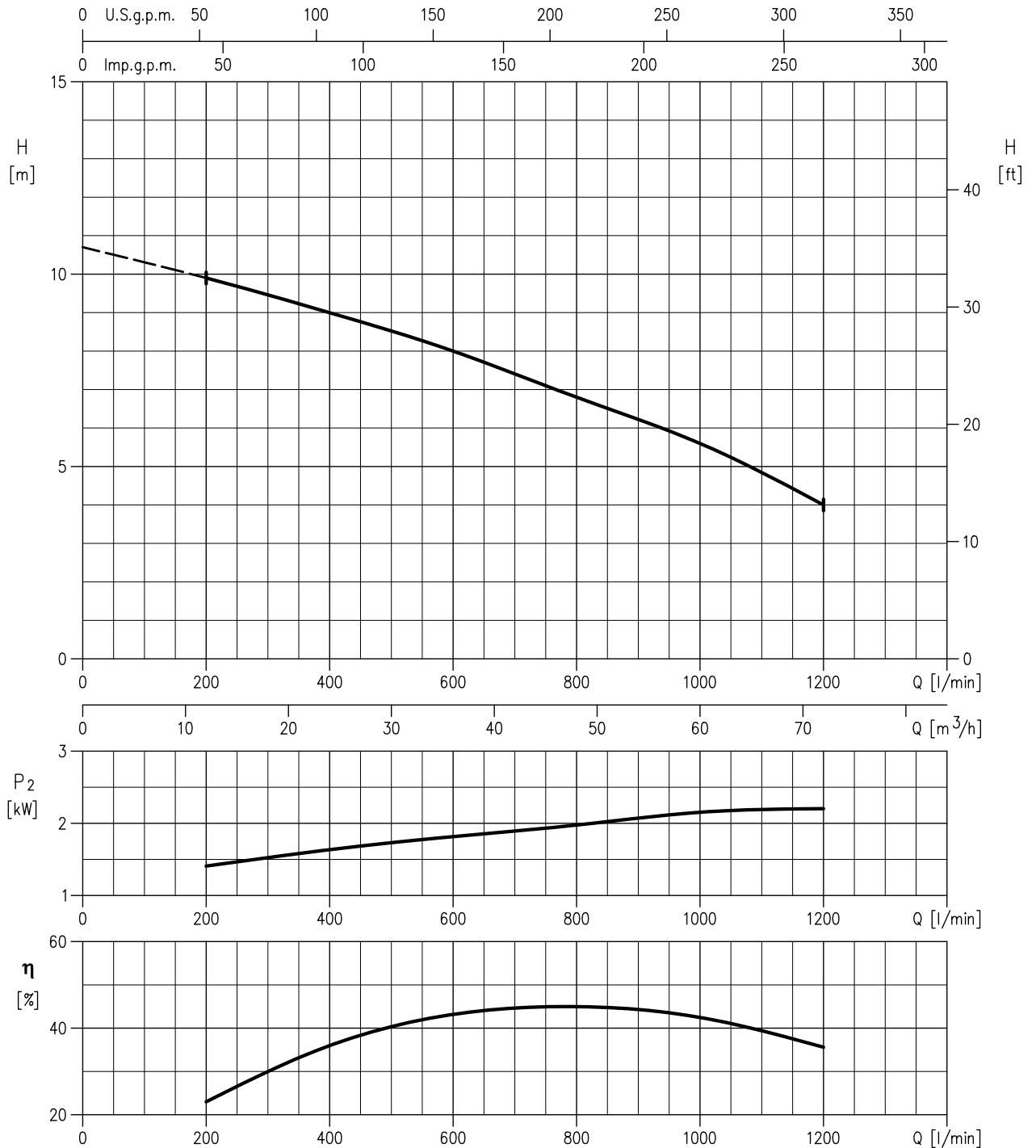
Selection Chart



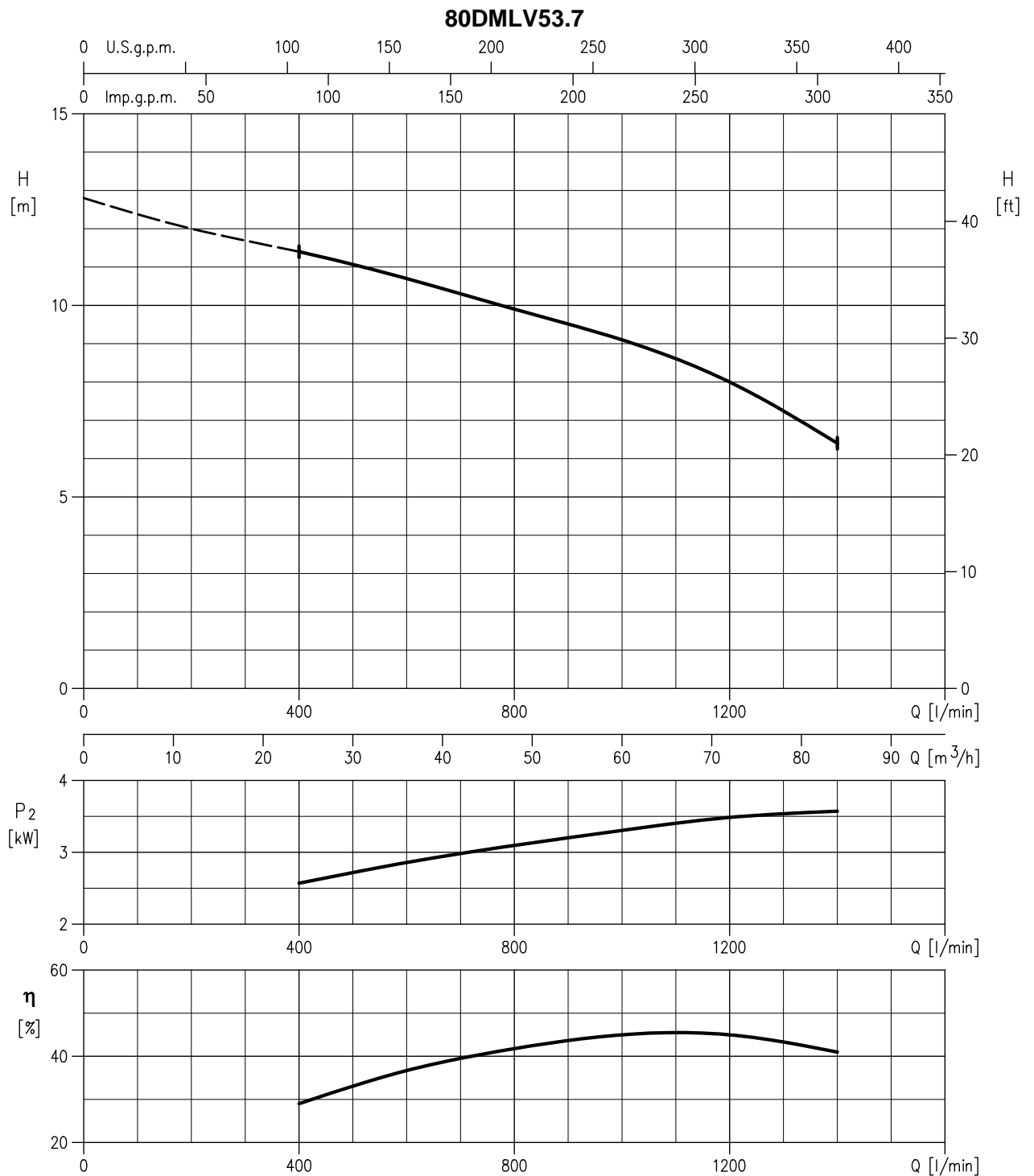
Model code



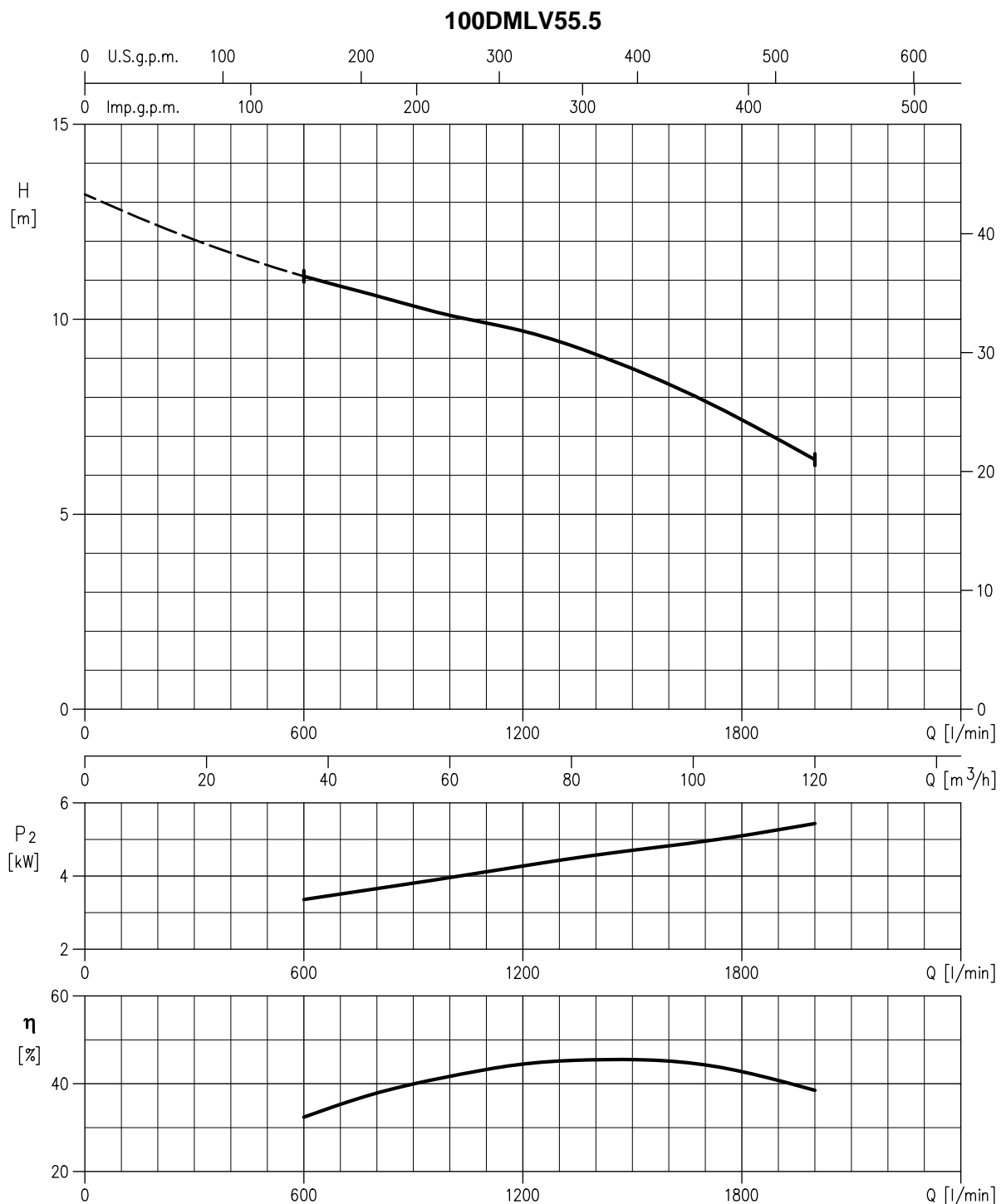
80DMLV52.2



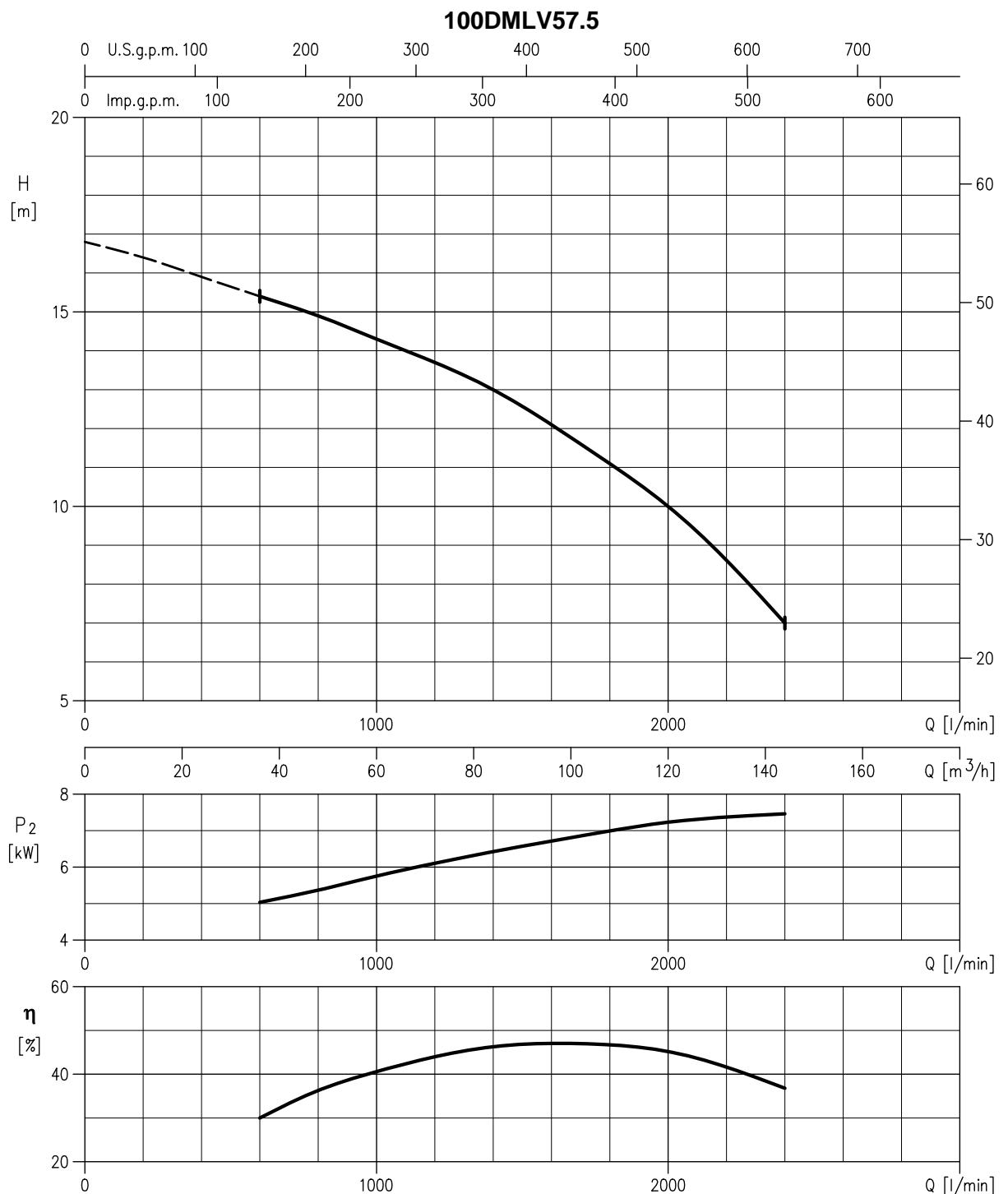
Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A



Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

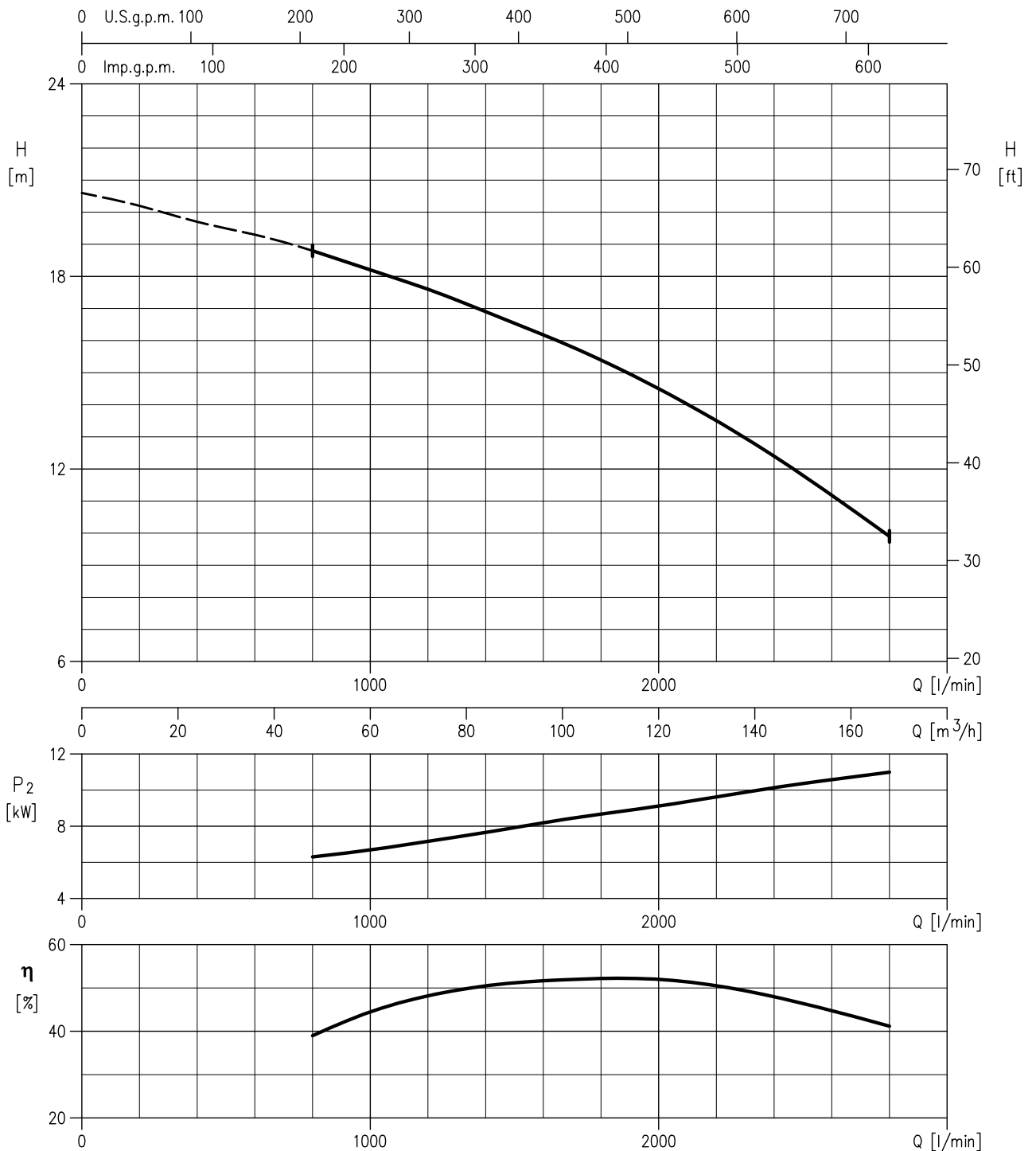


Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A



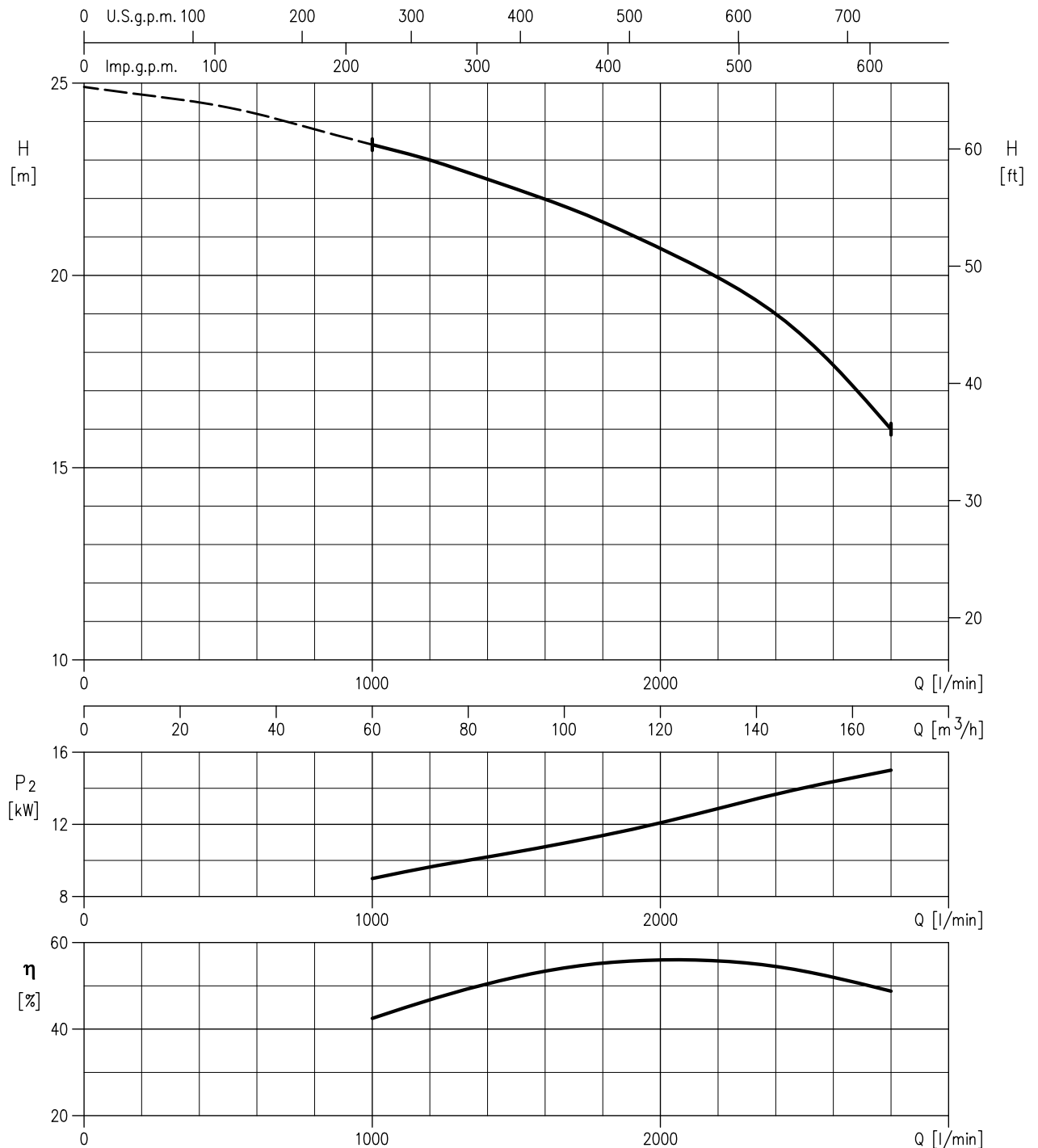
Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

100DMLV511



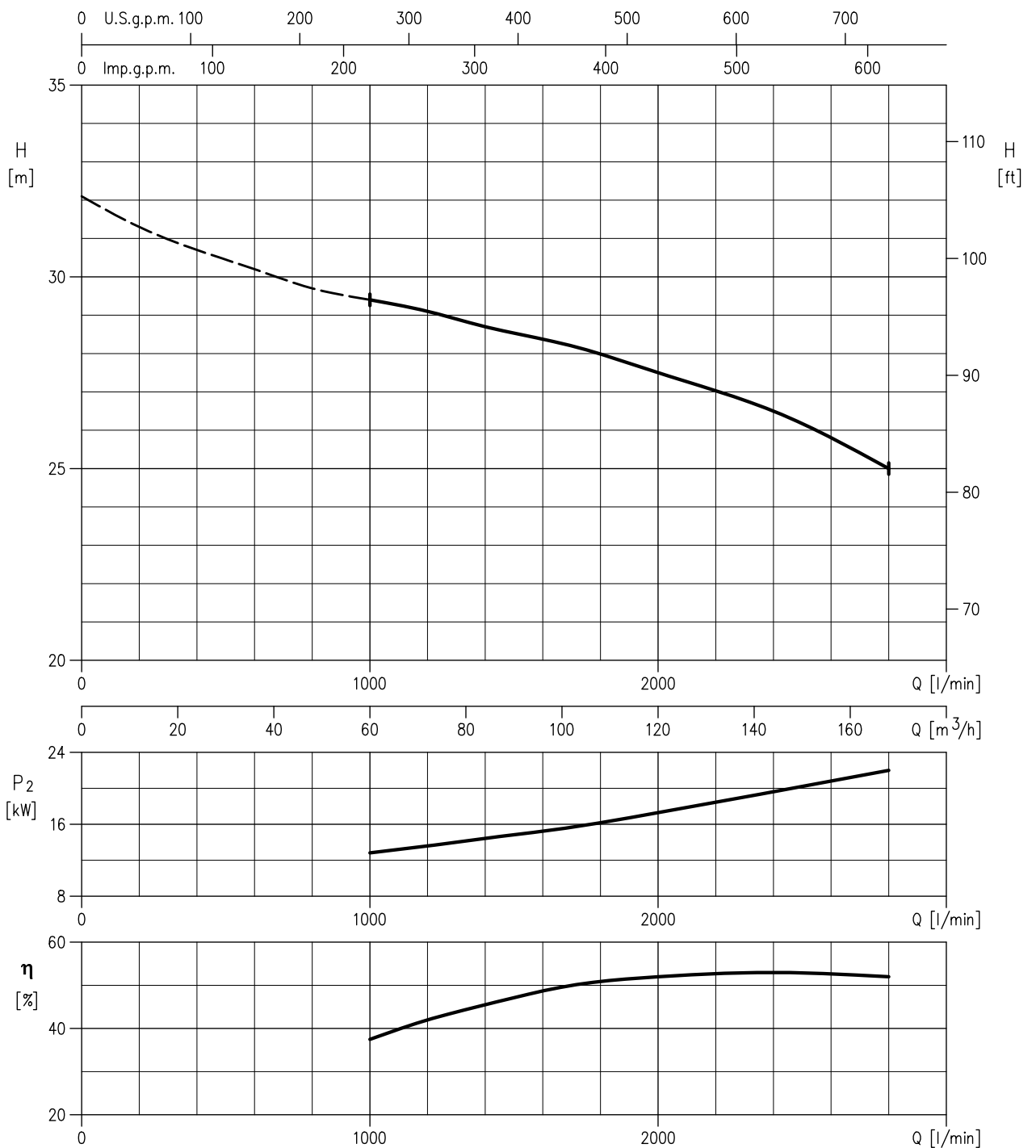
Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

100DMLV515L

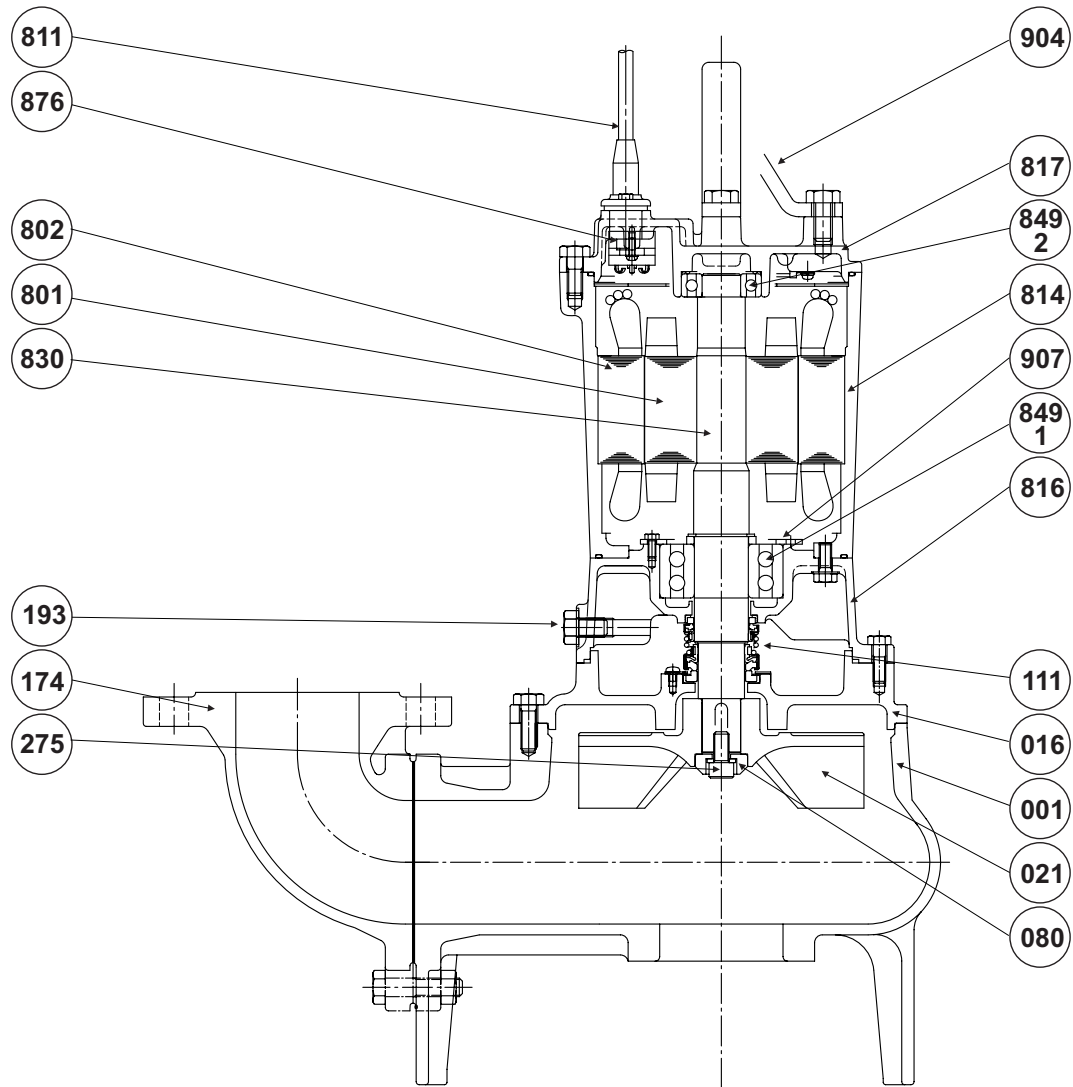


Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

100DMLV522



Rotation speed $\approx 1450 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A



Item Number	Description	Material	Quantity per unit
001	Casing	FC200 Cast iron	1
016	Mechanical Seal Cover	FC200 Cast iron	1
021	Impeller	FC200 Cast iron	1
080	Bushing	SS Steel	1
111	Mechanical Seal		1
174	Discharge Elbow	FC200 Cast Iron	1
193	Oil Plug	NBR/SUS NBR & Stainless Steel	1
275	Impeller Bolt	SUS304 Stainless Steel	1
801	Rotor		1
802	Stator		1

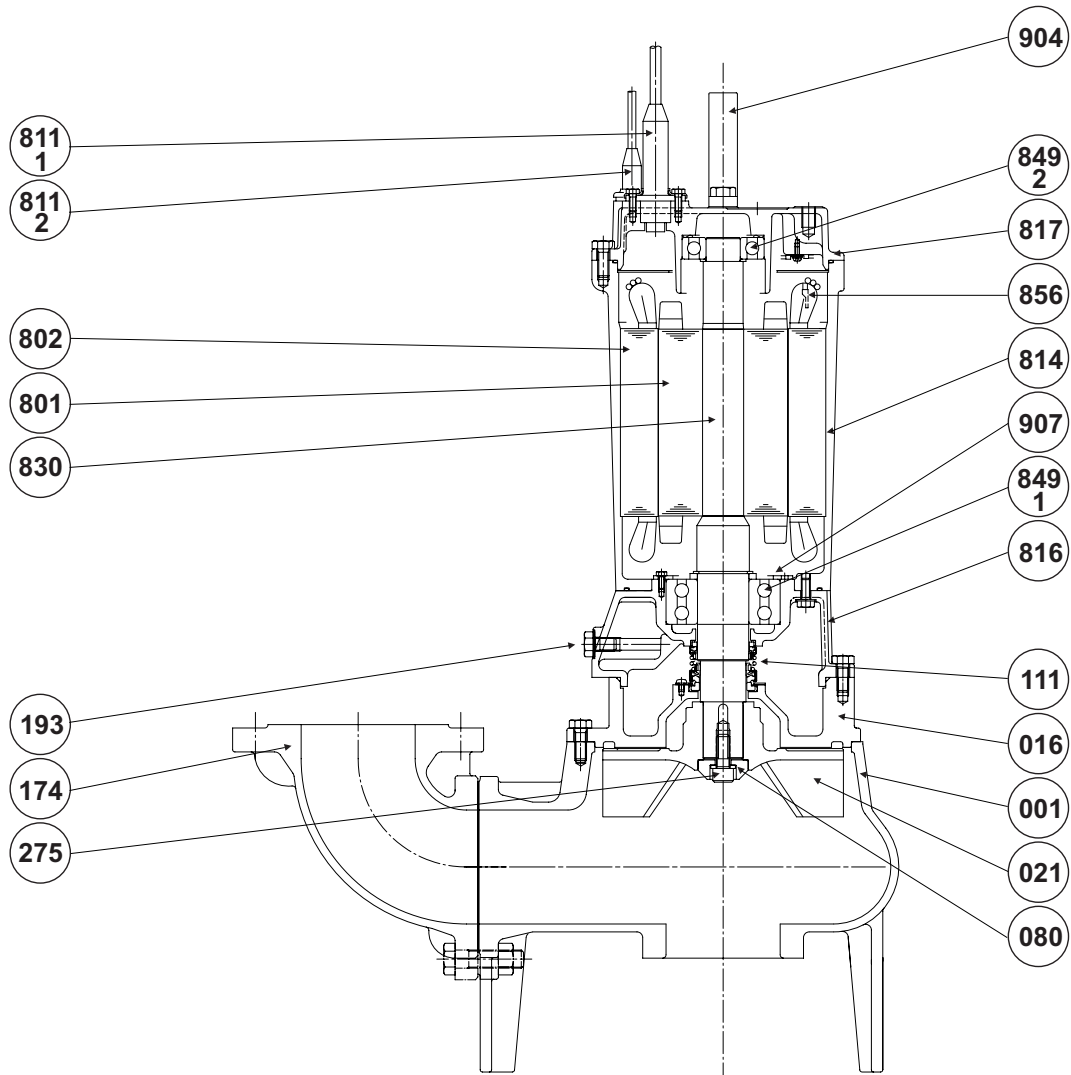
Item Number	Description	Material	Quantity per unit
811	Cable		1
814	Motor Frame	FC200 Cast iron	1
816	Lower Bracket	FC200 Cast iron	1
817	Upper Bracket	FC200 Cast iron	1
830	Shaft #	SUS403 Stainless Steel	1
849-1	Ball Bearing		1
849-2	Ball Bearing		1
876	Auto Cut		1
904	Lifting Hanger	SS Steel	1
907	Bearing Cover	SPCC Steel	1

refers to pump side of shaft material

Sectional View

DMLV 3.7 ~7.5kW

80DMLV (3.7 kW)
100DMLV (3.7~7.5 kW)



Item Number	Description	Material	Quantity per unit
001	Casing	FC200 Cast iron	1
016	Mechanical Seal Cover	FC200 Cast iron	1
021	Impeller	FC200 Cast iron	1
080	Bushing	SS Steel	1
111	Mechanical Seal		1
174	Discharge Elbow	FC200 Cast Iron	1
193	Oil Plug	NBR/SUS NBR & Stainless Steel	1
275	Impeller Bolt	SUS304 Stainless Steel	1
801	Rotor		1
802	Stator		1

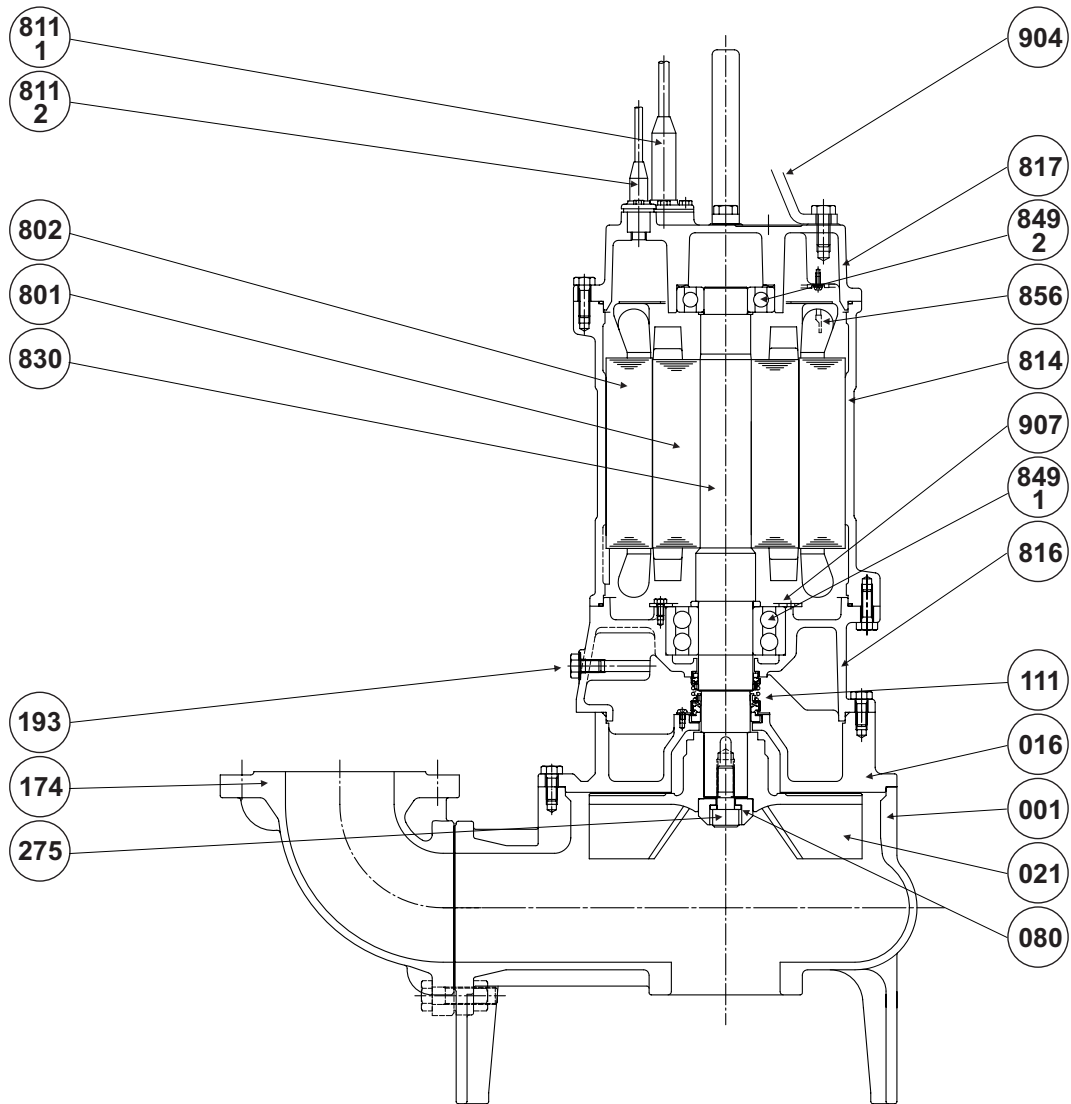
Item Number	Description	Material	Quantity per unit
811-1	Cable (Power)		2
811-2	Cable (Signal)		1
814	Motor Frame	FC200 Cast iron	1
816	Lower Bracket	FC200 Cast iron	1
817	Upper Bracket	FC200 Cast iron	1
830	Shaft #	SUS403 Stainless Steel	1
849-1	Ball Bearing		1
849-2	Ball Bearing		1
856	Thermal Protector		2
904	Lifting Hanger	SS Steel	1
907	Bearing Cover	SPCC Steel	1

refers to pump side of shaft material

Sectional View

DMLV 11 ~22 kW

100DMLV (11~22 kW)



Item Number	Description	Material	Quantity per unit
001	Casing	FC200 Cast iron	1
016	Mechanical Seal Cover	FC200 Cast iron	1
021	Impeller	11 kW FC200 Cast iron	1
		15-22 kW FCD400 Ductile Cast iron	
080	Bushing	SS Steel	1
111	Mechanical Seal		1
174	Discharge Elbow	FC200 Cast Iron	1
193	Oil Plug	NBR/SUS NBR & Stainless Steel	1
275	Impeller Bolt	SUS304 Stainless Steel	1
801	Rotor		1
802	Stator		1

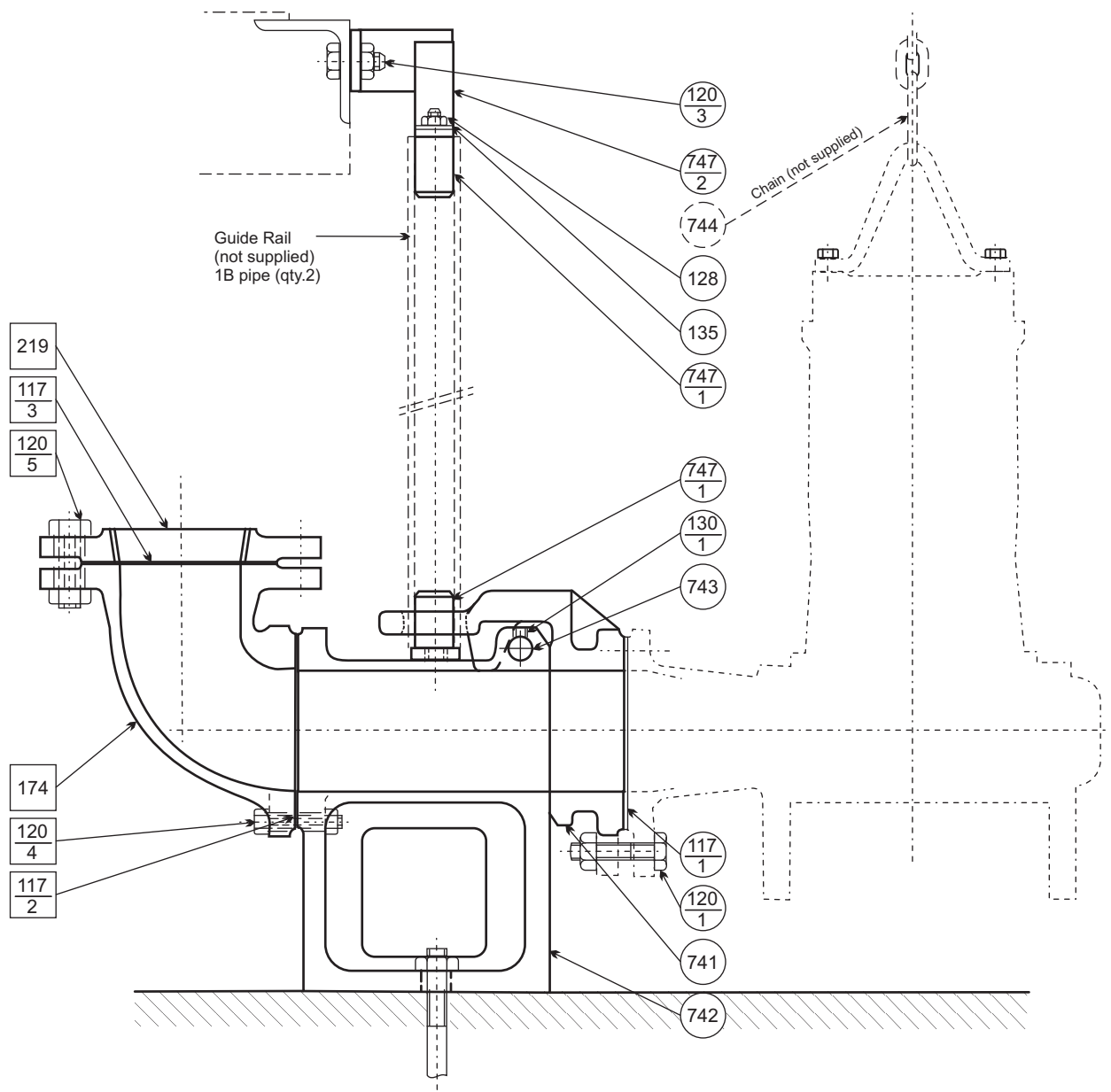
Item Number	Description	Material	Quantity per unit
811-1	Cable (Power)		2
811-2	Cable (Signal)		1
814	Motor Frame	FC200 Cast iron	1
816	Lower Bracket	FC200 Cast iron	1
817	Upper Bracket	FC200 Cast iron	1
830	Shaft #	SUS403 Stainless Steel	1
849-1	Ball Bearing		1
849-2	Ball Bearing		1
856	Thermal Protector		2
904	Lifting Hanger	SS Steel	1
907	Bearing Cover	SPCC Steel	1

refers to pump side of shaft material

Sectional View

Model LM 80 Quick Discharge Connector

Applicable to 80mm 2.2 & 3.7 kW DMLV models



Item Number	Description	Material	Quantity per unit
117-1	Gasket	NBR Rubber	1
117-2	Gasket	NBR Rubber	1
117-3	Gasket	NBR Rubber	1
120-1	Bolt & Nut	SUS Stainless Steel	4
120-3	Bolt & Nut	SUS Stainless Steel	2
120-4	Bolt & Nut	SUS Stainless Steel	4
120-5	Bolt & Nut	SUS Stainless Steel	4or8
128	Nut	SUS Stainless Steel	2
130-1	Set Screw	SUS Stainless Steel	1

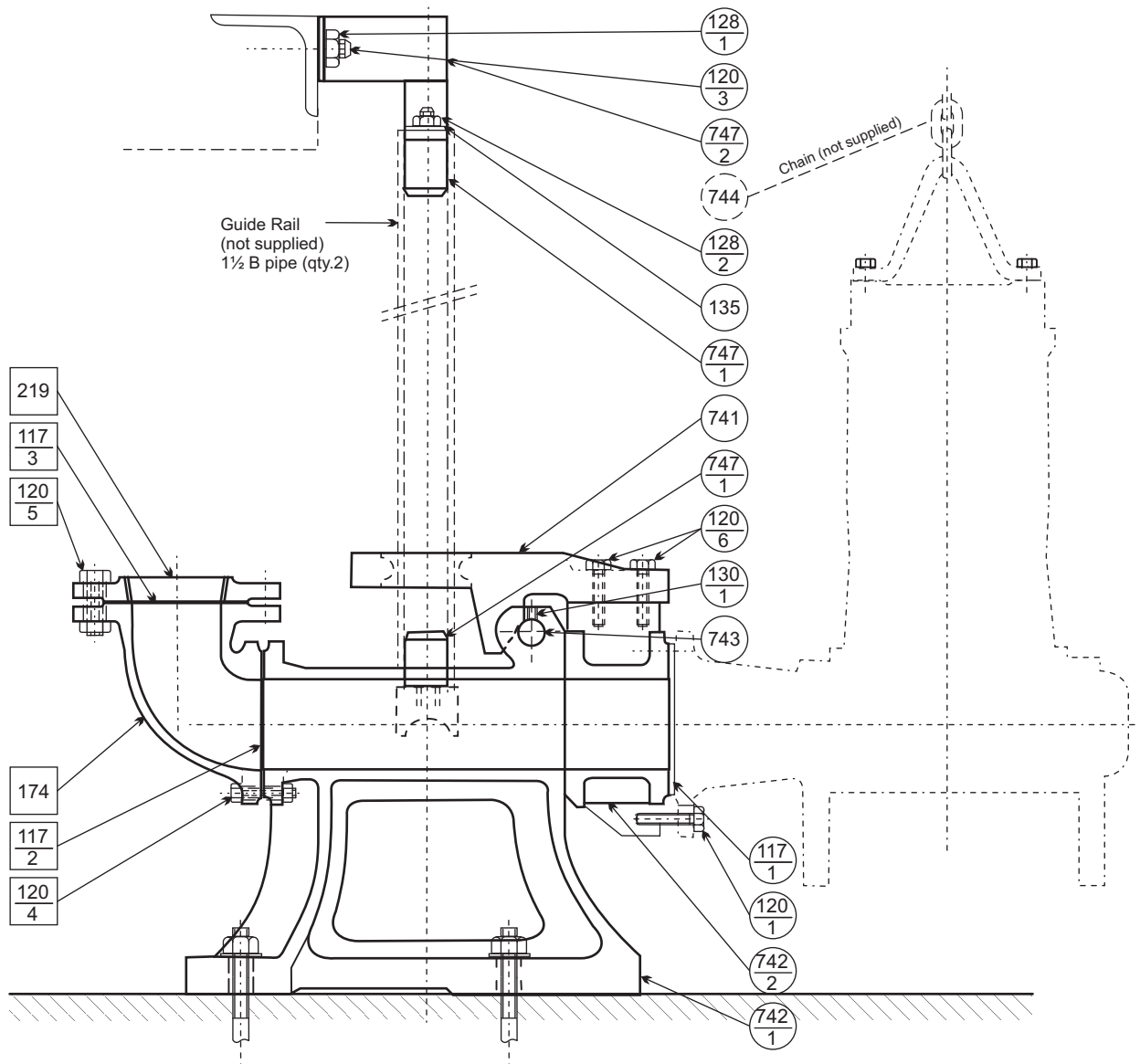
Item Number	Description	Material	Quantity per unit
135	Washer	SUS Stainless Steel	2
174	Discharge Bend	FC200 Cast iron	1
219	Companion Flange	FC200 Cast iron	1
741	Sliding Guide	FC200 Cast iron	1
742	QDC Body	FC200 Cast iron	1
743	Suspension Bar	SUS Stainless Steel	1
744	Chain	(Not supplied)	1
747-1	Guide Pin	S17C Steel	4
747-2	Guide Support	SS Steel	1

Note: Those parts with item number indicated in a are supplied with the pump.

Sectional View

Model LL 100 Quick Discharge Connector

Applicable to all 5.5 to 22 kW DMLV models

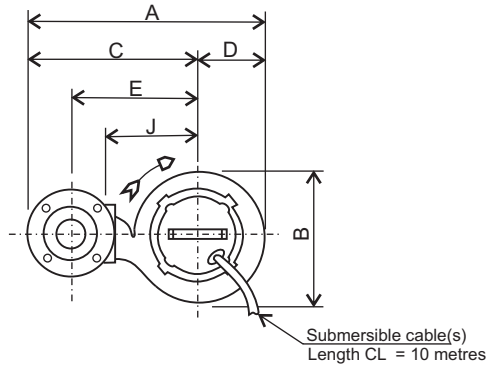


Item Number	Description	Material	Quantity per unit
117-1	Gasket	NBR Rubber	1
117-2	Gasket	NBR Rubber	1
117-3	Gasket	NBR Rubber	1
120-1	Bolt	SUS Stainless Steel	4
120-3	Bolt	SUS Stainless Steel	2
120-4	Bolt & Nut	SUS Stainless Steel	4
120-5	Bolt & Nut	SUS Stainless Steel	4or8
120-6	Bolt	SUS Stainless Steel	4
128-1	Nut	SUS Stainless Steel	2
128-2	Nut	SUS Stainless Steel	2
130-1	Set Screw	SUS Stainless Steel	1

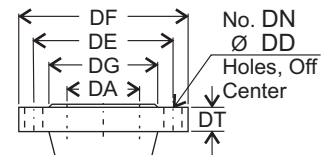
Item Number	Description	Material	Quantity per unit
135	Washer	SUS Stainless Steel	2
174	Discharge Bend	FC200 Cast iron	1
219	Companion Flange	FC200 Cast iron	1
741	Sliding Guide	FCD400 Cast Iron	1
742-1	QDC Body	FC200 Cast iron	1
742-2	QDC Flange	FC200 Cast iron	1
743	Suspension Bar	SUS Stainless Steel	1
744	Chain	(Not supplied)	1
747-1	Guide Pin	SS400 Steel	4
747-2	Guide Support	SS Steel	1

Note: Those parts with item number indicated in a are supplied with the pump.

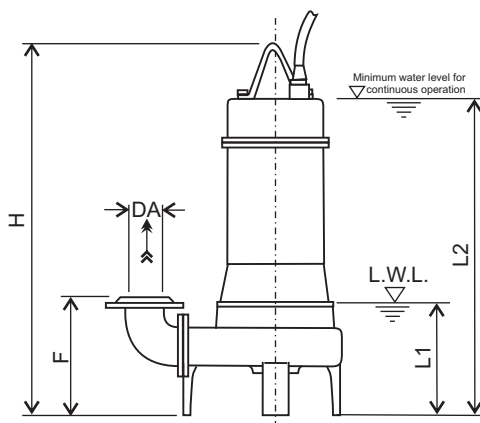
Dimensions



Discharge Flange Dimensions
(JIS 10kgf/cm²)



DA	DE	DF	DG	DT	DN	DD
80	150	185	126	18	4	15
100	175	210	151	20	8	15

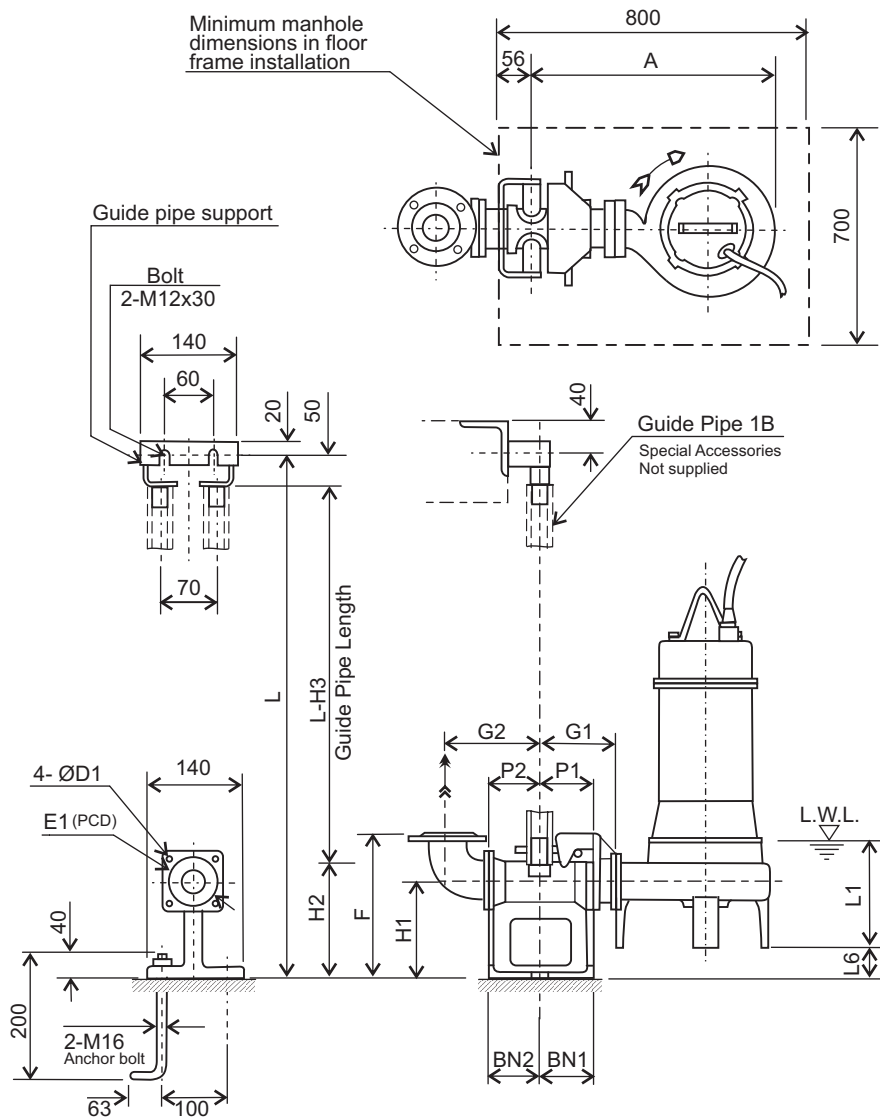


Note:

- 1/. L1 (Low Water Level) - Limited to 10 minutes operation at low water level
- 2/. L2 - Limited to 30 minutes operation with water level below motor cap.

Size DA	Model	Output KW	A	B	C	D	E	F	H	J	L1	L2	Weight
80	80 DMLV 52.2	2.2	518	285	375	143	275	254	660	200	200	560	70 kg
	80 DMLV 53.7	3.7	518	285	375	143	275	254	721	200	200	620	80 kg
100	100 DMLV 55.5	5.5	584	308	430	154	320	305	860	215	250	760	105 kg
	100 DMLV 57.5	7.5	641	352	465	176	355	305	860	250	250	760	120 kg
	100 DMLV 511	11	641	352	465	176	355	305	970	250	250	810	150 kg
	100 DMLV 515L	15	728	426	515	213	405	305	970	300	250	810	180 kg
	100 DMLV 522	22	728	426	515	213	405	305	1045	300	250	865	235 kg

Units: mm unless otherwise specified



Note:

1/ For detailed dimensions of the pumps, refer to separate dimension data sheets.

2/ The discharge bend and companion flange supplied with the pump are used with the QDC.

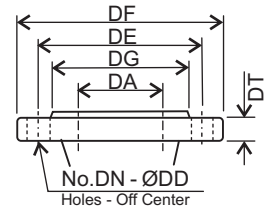
3/ The weight in dimension tables refers only to the weight of the QDC.

4/ Standard accessories supplied with QDC include:-

- Connector body with foundation bolts.
- Guide pipe support
- Sliding Glide
- Adaptor Flange

Guide Pipe is not supplied.

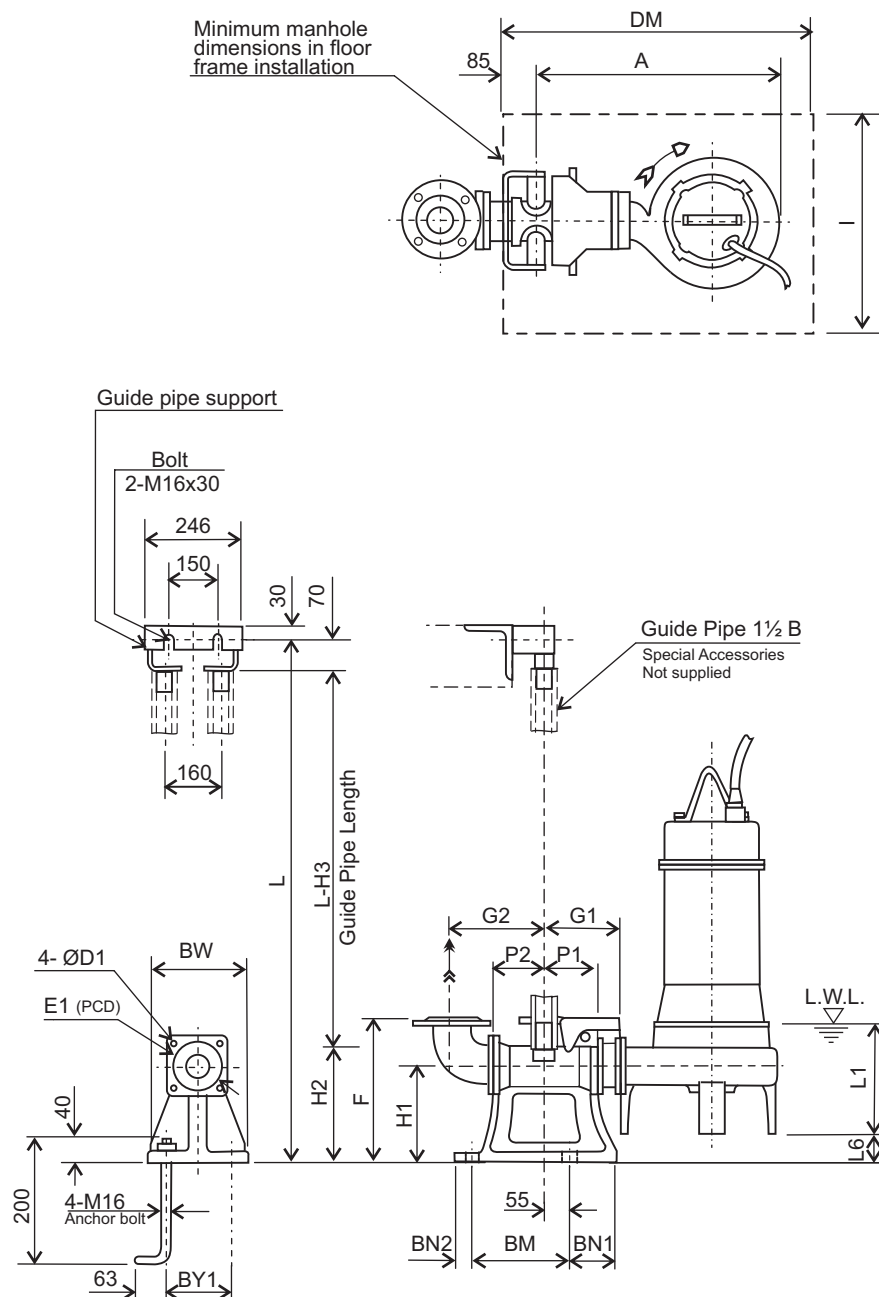
Discharge Flange
(JIS 10kgf/cm²)



DA	DE	DF	DG	DT	DN	DD
80	150	185	126	18	8	15

Pump Model	A	P1	P2	G1	G2	F	H1	H2	H3	L1	L6	BN1	BN2	D1	E1	QDC Model	Weight (Of QDC only)
80 DMLV 52.2	468	75	90	125	165	285	175	230	280	200	31	75	90	15	155	LM80	17 kg
80 DMLV 53.7	468	75	90	125	165	285	175	230	280	200	31	75	90	15	155	LM80	17 kg

Units: mm unless otherwise specified



Note:

1/ For detailed dimensions of the pumps, refer to separate dimension data sheets.

2/ The discharge bend and companion flange supplied with the pump are used with the QDC.

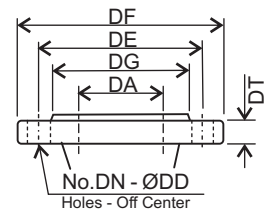
3/ The weight in dimension tables refers only to the weight of the QDC.

4/ Standard accessories supplied with QDC include:-

- Connector body with foundation bolts.
- Guide pipe support
- Sliding Glide
- Adaptor Flange

Guide Pipe is not supplied.

Discharge Flange
(JIS 10kgf/cm²)



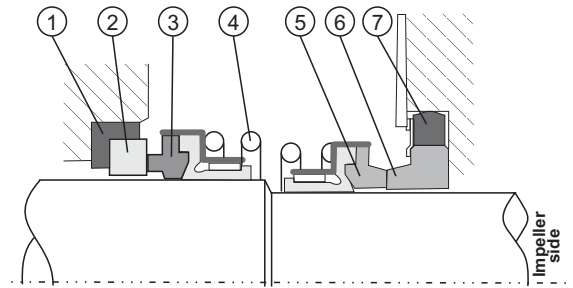
DA	DE	DF	DG	DT	DN	DD
100	175	210	151	20	8	15

Pump Model	A	P1	P2	G1	G2	F	H1	H2	H3	L1	L6	BN1	BN2	BM	BY1	BW	DM	I	D1	E1	QDC Model	Weight (Of QDC only)
100 DMLV 55.5	554	105	105	185	210	365	240	265	335	250	60	100	40	230	180	230	800	700	19	175	LL100	46 kg
100 DMLV 57.5	554	105	105	185	210	365	240	265	335	250	60	100	40	230	180	230	800	700	19	175	LL100	46 kg
100 DMLV 511	611	105	105	185	210	365	240	265	335	250	60	100	40	230	180	230	800	700	19	175	LL100	46 kg
100 DMLV 515L	698	105	105	185	210	365	240	265	335	300	60	100	40	230	180	230	1000	700	19	175	LL100	46 kg
100 DMLV 522	698	105	105	185	210	365	240	265	335	300	60	100	40	230	180	230	1000	700	19	175	LL100	46 kg

Units: mm unless otherwise specified

Applicable Models	Output kW	Mechanical Seal Type	Lubricating Oil		Bearings	
			Capacity - CC	Type	Bottom	Top
DMLV	2.2	EAN-30	1100	Turbine Oil SAE 10W or SAE 20W (Turbine Oil#32)	5307ZZ	6205ZZ
	3.7				5307ZZ	6205ZZ
	5.5	EAN-40	1780		5309ZZ	6306ZZ
	7.5				5309ZZ	6306ZZ
	11	EAN-45	3380		5310ZZ	6308ZZ
	15				5310ZZ	6308ZZ
	22				3350	6312ZZ R2

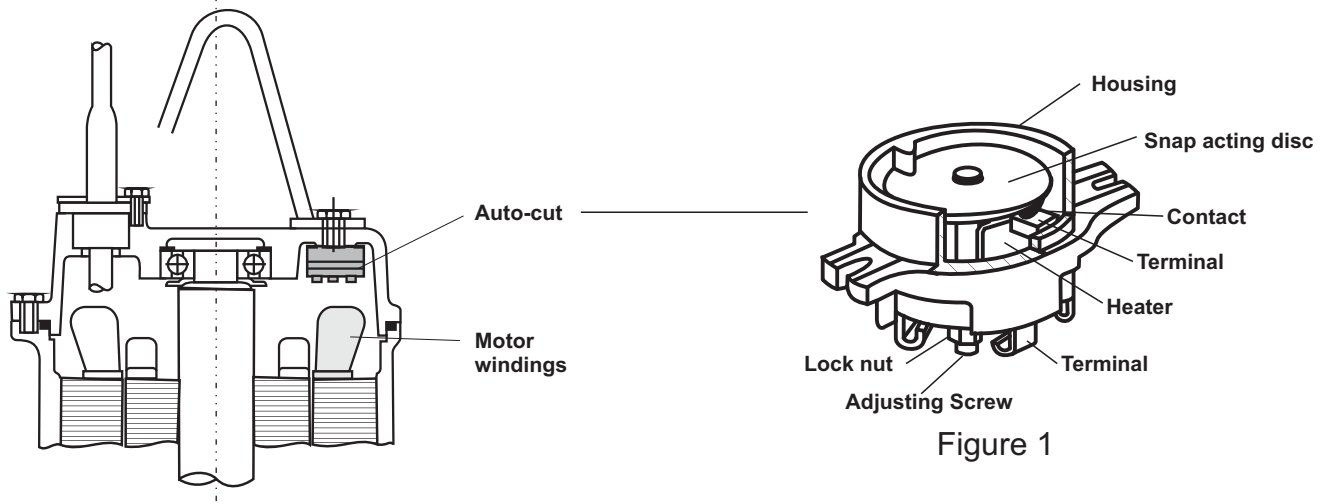
No.	Part Name	Material	No. per Set	Type
1	Packing	N.B.Rubber	1	EAN-30 EAN-40 EAN-45
2	Floating Ring	Ceramic	1	
3	Seal Ring	Carbon Graphite	1	
4	Spring	304 SS	1	
5	Seal Ring	Silicon Carbide	1	
6	Floating Ring	Silicon Carbide	1	
7	Packing	N.B.Rubber	1	



Applicable to 2.2 kW DMLV only

The three pole model that is used for three phase models is illustrated below.

The Auto-Cut consists of: 3 sets of contacts, 1 snap-acting disk, 3 heaters, 3 terminals and 1 calibration bolt and nut, all enclosed in a bakelite housing.



The Auto-Cut is installed directly over the motor winding of the motor where it not only senses over heating of the winding but also excess amperage draw by each winding.

Figure 2 shows the Auto-Cut in its normal operating condition (contacts closed). When actuating temperature is reached, the snap acting disc opens to interrupt the circuit as shown in figure 3 and stops the motor.

When the motor temperature cools down to the safe operating temperature, the snap acting disc resets automatically to the original position as shown in figure 2, and the motor restarts.

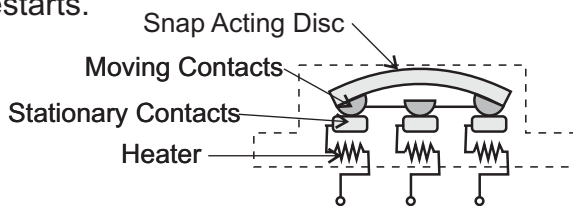


Figure 2

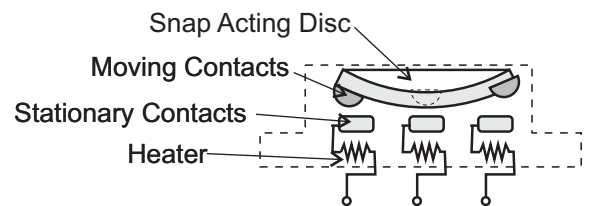


Figure 3

To suit models DMLV		
Phase	Power kW	Auto-Cut
3Ø	2.2	KA-313-GCXL102

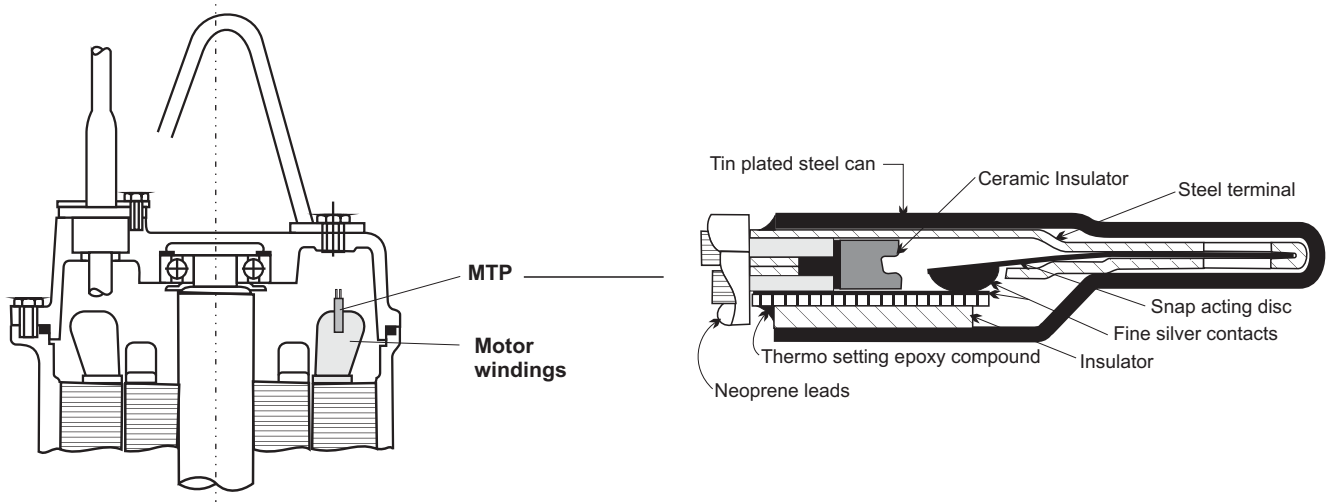
Technical Data

Miniature Thermal Protector

Applicable to 3.7 to 22 kW DML

Two Miniature Thermal Protectors (MTP) are embedded in the windings of the motor as illustrated below, and provides automatic cut off with manual reset.

When the temperature of the windings increases and reaches the MTP acting point, an external motor protection circuit (not supplied) is activated.



Specifications

for 380/400/415 Volt, 50Hz, 3 phase motors

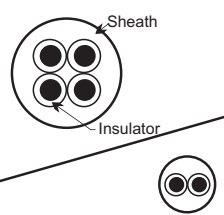

	to suit models DMLV 3.7 to 22 kW
Model	Klixon 9700K-46-215
Type of contact	b (Normally - Closed, Acting-Open)
Acting temperature	150 ± 5°C
Re-setting temperature	Approx 100°C
Contact Rating	DC 24V - 18A
	AC 230V - 13A

Technical Data

Cable Specifications

Applicable Models		Motor kW	Starting method	Length of cable	Material	Number & size of conductor(s)		
						Power Cable(s)		Protector Cable
DMLV	Three Phase	2.2	DOL	10m	H07RN-F	1 of	4 x 1.5 mm ²	2 x 1 mm²
		3.7	Y-Δ	10m	H07RN-F	2 of	4 x 1.5 mm ²	2 x 1 mm ²
		5.5	Y-Δ	10m	H07RN-F	2 of	4 x 1.5 mm ²	2 x 1 mm ²
		7.5	Y-Δ	10m	H07RN-F	2 of	4 x 1.5 mm ²	2 x 1 mm ²
		11	Y-Δ	10m	H07RN-F	2 of	4 x 4 mm ²	2 x 1 mm ²
		15	Y-Δ	10m	H07RN-F	2 of	4 x 4 mm ²	2 x 1 mm ²
		22	Y-Δ	10m	H07RN-F	2 of	4 x 6 mm ²	2 x 1 mm ²

DMLV models 3.7 kW and above are designed for connection to a star delta starter, having two of 4 core power cables. They also have miniature thermal protectors embedded in the windings of the motor using a 2 core cable for connection to an external motor protection circuit (not supplied).

Item	Cross sectional area of conductors	No. of conductors	Cable Type	Sheath Material	Insulation Material	Sheath Thickness mm	Insulation Thickness mm	Overall Diameter mm	
Three Phase Power Cables	1.5 mm ²	4	H07RN-F	PCR	EPR	1.7	0.8	11.2	
	4 mm ²					2.0	1.0	15.4	
	6 mm ²					2.3	1.0	18.1	
Protector Cable	1 mm ²	2	H07RN-F	PCR	EPR	1.3	0.8	8.7	

PCR = Polychloroprene Rubber

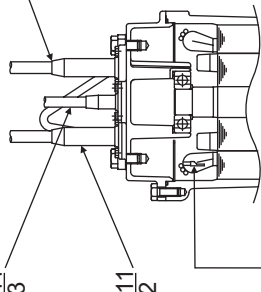
EPR = Ethylene Propylene Rubber

Motor Data

2.2 to 22 kW, Three Phase, 4 Pole Motors

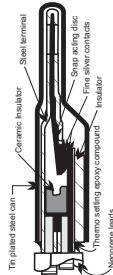
Nameplate Rating	Model	ZDMEU	ZDMEU	ZDMEU	ZDMEU	ZDMEU	ZDMEU	ZDMEU
	Output kW	2.2	3.7	5.5	7.5	11	15	22
	Phase	3	3	3	3	3	3	3
	Poles	4	4	4	4	4	4	4
	Volts	400	400	400	400	400	400	400
	Amps	5.20	8.40	12.60	16.90	23.80	31.00	42.00
	Speed (min ⁻¹)	1410	1420	1440	1440	1440	1450	1460
	Insulation Class	F	F	F	F	F	F	F
No Load Test	Amps	2.52	3.88	6.67	8.41	10.15	13.13	16.27
	Watts	480	780	1200	1300	1450	1650	2000
Resistance at 20°C	Ohms	7.015	3.623	1.920	1.326	0.862	0.563	0.308
75% Load	Current (Amps)	4.21	6.77	10.51	14.06	19.27	25.03	33.38
	Efficiency (%)	68.45	71.40	72.26	76.86	75.49	78.43	85.54
	Power Factor (%)	82.63	82.84	78.43	75.16	81.87	82.71	83.40
	Speed (min ⁻¹)	1437	1443	1456	1460	1461	1464	1475
100% Load	Current (Amps)	5.20	8.40	12.60	16.90	23.80	31.00	42.00
	Efficiency (%)	69.50	72.71	74.50	79.01	77.41	80.23	86.52
	Power Factor (%)	87.56	87.44	84.27	80.89	85.82	86.77	87.27
	Speed (min ⁻¹)	1411	1422	1440	1447	1446	1451	1466
Locked Rotor Torque (%)		204	226	252	256	170	195	172
Start Current (Amps)		25.70	48.10	82.60	116.50	136.00	211.90	318.50
No. starts per hour		10	10	10	10	7	7	7
Voltage Tolerance		± 10%	± 10%	± 10%	± 10%	± 10%	± 10%	± 10%
Frequency Tolerance		± 5%	± 5%	± 5%	± 5%	± 5%	± 5%	± 5%
GD ² (kg ²)		0.02	0.03	0.059	0.076	0.12	0.16	0.34
Mfr's Symbol		EB	EB	EB	EB	EB	EB	EB

All specifications subject to change without notice



Item Number	Description	Material	Quantity per unit
811-1	Cable	4 core power cable	1
811-2	Cable	4 core power cable	1
811-3	Cable	2 core protector cable	1
856	Thermal Protector	Klixon 9700K-46-215	2

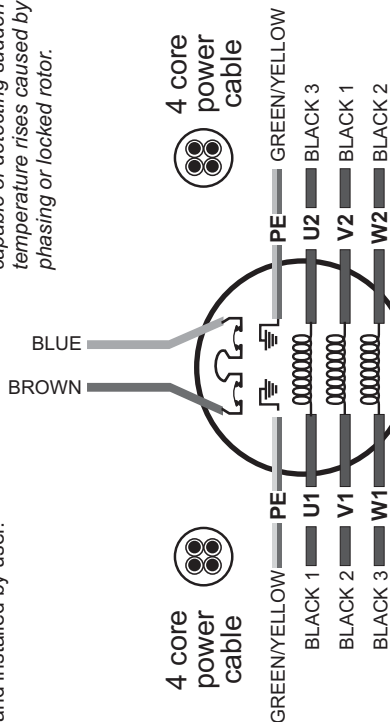
Model	to suit models DML 3.7 to 22 kW
Type of contact	Klixon 9700K-46-215
Acting temperature	b (Normally - Closed, Acting-Open)
Re-setting temperature	150 ± 5°C
Contact Rating	Approx 100°C
	DC 24V - 18A
	AC 230V - 13A



DMLV models 3.7 kW and above are designed for connection to a start-delta starter, having two of 4 core power cables. They also have Miniature Thermal Protectors (MTP's) embedded in the winding of the motor, which provides automatic cut off with manual reset. When the temperature of the windings increases and reaches the MTP acting point, an external motor protection circuit (not supplied) is activated.

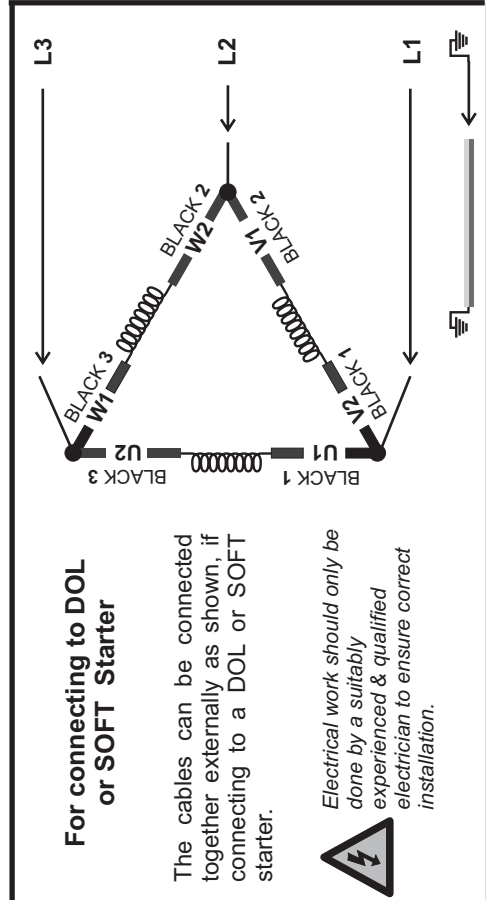
To be connected to external protection equipment supplied and installed by user.

Appropriate thermal overload relays must be installed in the control panel, since the thermal protector is not capable of detecting sudden temperature rises caused by single phasing or locked rotor.



Cable tags on the end of each cable

The cable number is printed along each black cable.



For connecting to DOL or SOFT Starter

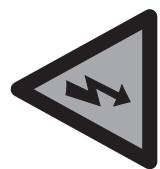
The cables can be connected together externally as shown, if connecting to a DOL or SOFT starter.

Electrical work should only be done by a suitably experienced & qualified electrician to ensure correct installation.



All electrical work must be performed correctly by a qualified electrician and all national and local electrical codes must be observed.

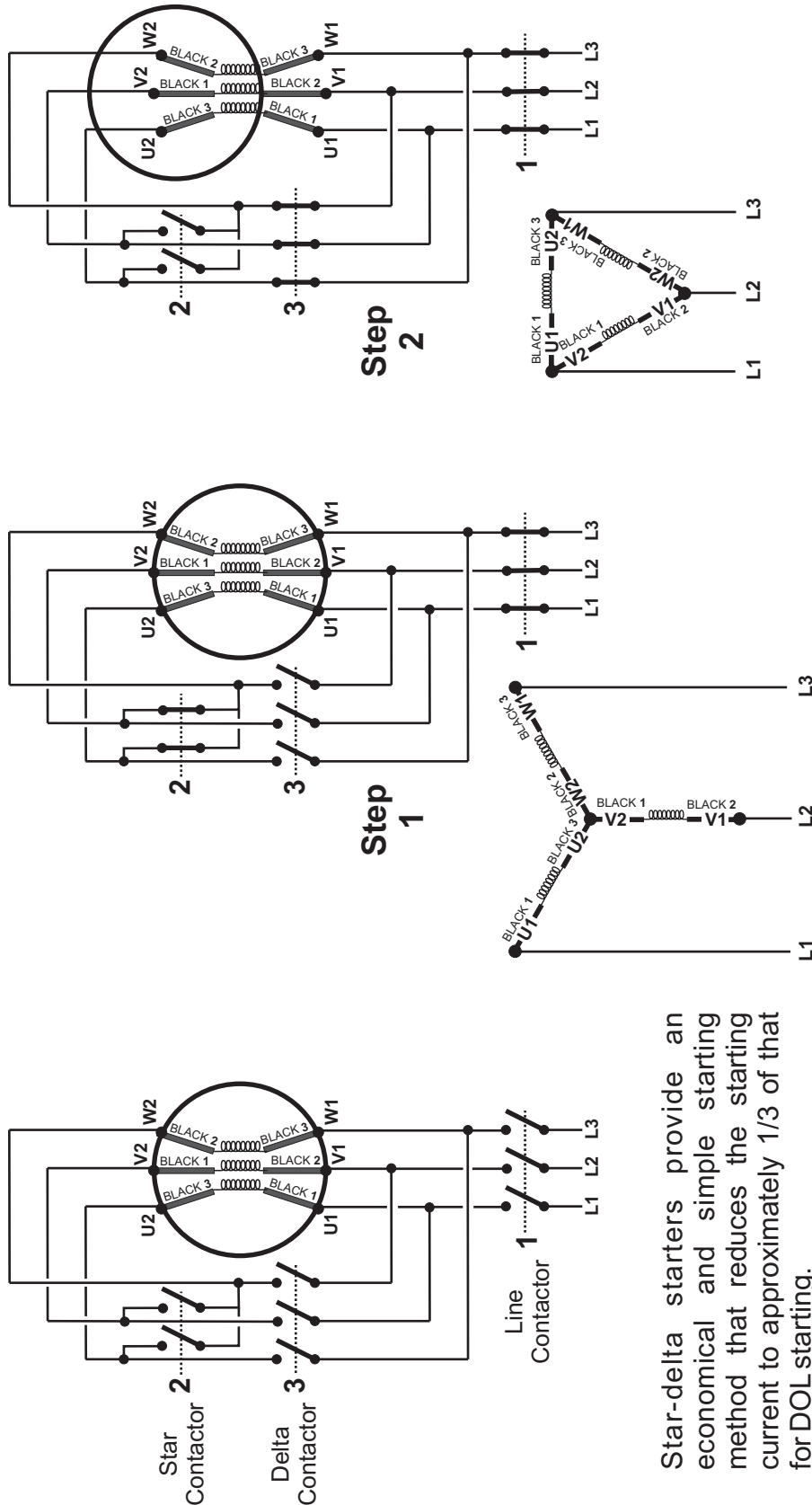
Note: Refer to instruction manual supplied with pump



All specifications subject to change without notice

Applicable to
3.7 to 22 kW DMLV models

Example of Star-Delta Starting



Star-delta starters provide an economical and simple starting method that reduces the starting current to approximately 1/3 of that for DOL starting.



All electrical work must be performed correctly by a qualified electrician and all national and local electrical codes must be observed.

Note: Refer to instruction manual supplied with pump