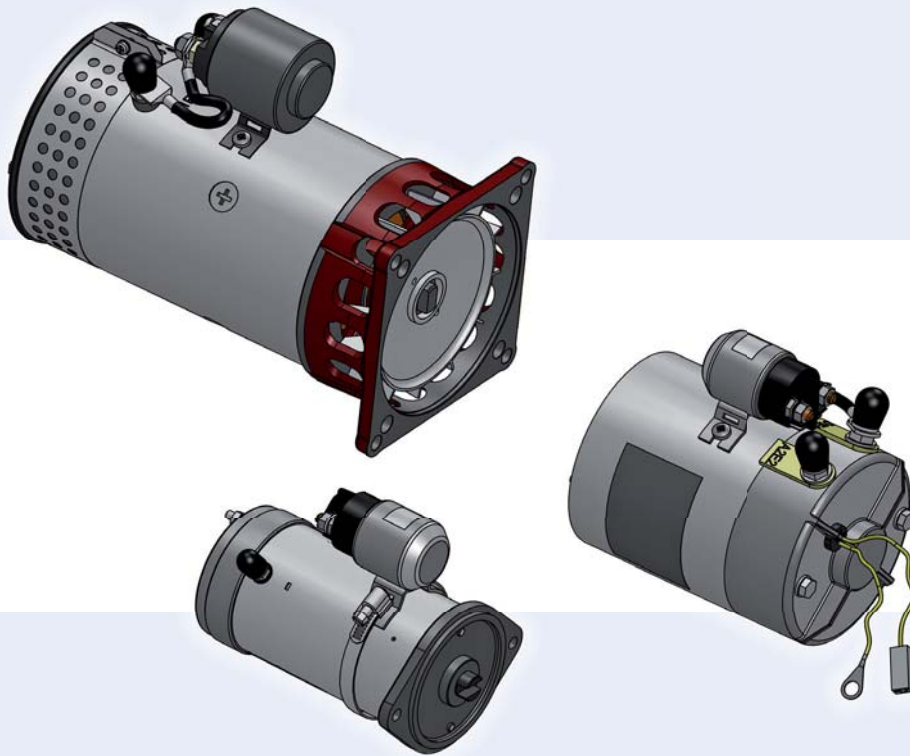


DIRECT CURRENT MOTORS

Technical Catalogue

January
2012



DC motors

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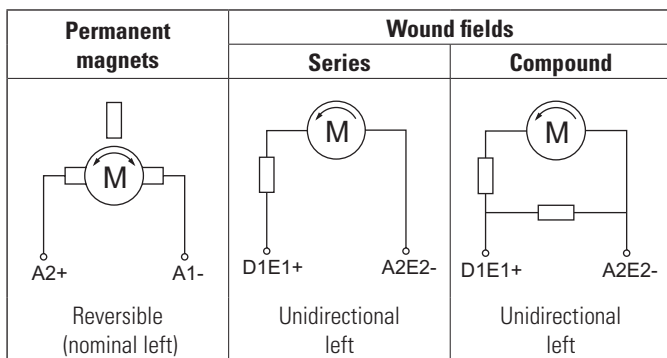
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This collection of technical tables lists all the DC motors approved by Brevini Fluid Power (hereafter called BFP) and used in power units of its standard production. BFP offers a wide range of DC motors with rated voltage from 12 V to 24 V and power from 350 W to 3000 W. The diagrams shown are determined from tests performed with the characteristics specified in the same technical tables” and using the standard power units manufactured by BFP. The curves thus show the performances of the power unit in relation to the pump installed. One table describes the main characteristics of the pumps specifying their size (group)

Motor typology

The two main types of DC motors used by BFP are:

- With permanent magnets, generally low power motors, reversible, in which the magnetic field is generated by permanent magnets and excitation is constant;
- With wound fields: generally medium power, unidirectional, where both excitation and armature windings are electrically driven. These are then divided into two other families: series connection and compound.



Duty cycle

In order to ensure the correct choice of the motor, must be known the type of duty cycle required by the application and it has to be compared with the motor features.

Duty types S1, S2, S3 are defined according to standards EN 60034-1, corresponding to CEI 2-3.

Definitions

Duty type

A continuous, short time or periodic duty, comprising one or more loads remaining constant for the duration specified, or a non-periodic duty in which generally load and speed vary within the permissible operating range.

Thermal equilibrium

The state reached when the temperature rises of the several parts of the machine do not vary by more than 2°C over a period of 1 h.

Cyclic duration factor

The ratio between the period of loading, including starting and electric braking, and the duration of the duty cycle, expressed as a percentage.

Continuous running duty – Duty type S1

Operation at constant load of sufficient duration for thermal equilibrium to be reached.

Short time duty – Duty type S2

Operation at constant load during a given time, less than that required to reach thermal equilibrium, followed by a rest and de-energized period of sufficient duration to re-establish initial conditions

Intermittent periodic duty – Duty type S3

A sequence of identical duty cycles, each including a period of operation at constant load and a rest and de-energized period. The duration of a cycle is generally 10 min. The value S3 is expressed as a percentage. For example S3=25% means that the load on the motor can be constant for 25% of cycle time (2.5 minutes); then you need a rest position for the remaining 75 % of cycle time (7.5 minutes) before starting over a new cycle.

Protection degree

The degree of protection is indicated in accordance with standard EN 60034-5 corresponding to CEI 2-16. The codes to indicate degree of protection are made by the letters IP followed by two characteristics numerals.

The protection degree are valid in many cases only for motors assembled on power units or other products manufactured by BFP.

Insulation class

The insulation class indicated is in accordance with standard EN corresponding to CEI 15-26. It indicates the maximum appropriate temperature for the product in nominal operating conditions, without damages to the insulating material of the motor.

Insulation class	Y	A	E	B	F	H
Temperature (°C)	90	105	120	130	155	180

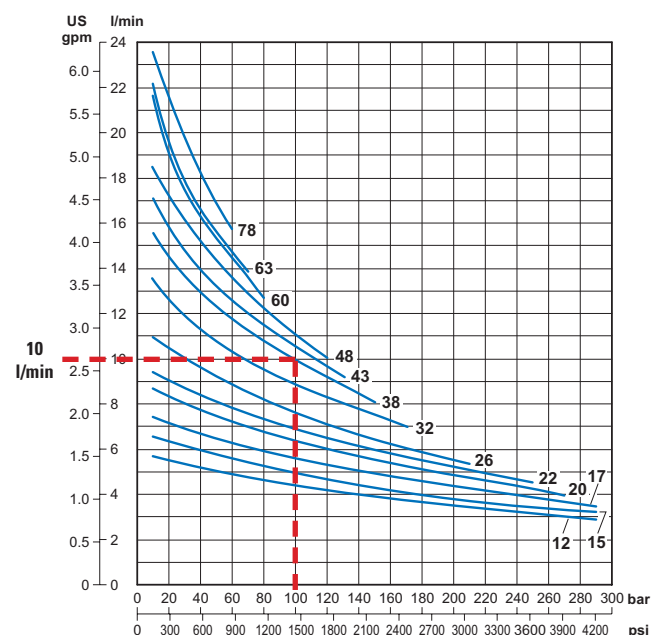
How to choose the motor

Each motor has its own characteristic curve. The main specifications are: flow rate (in l/min or US gpm), pressure (in bar or psi), current (in Ampere) and duty type S2 (in minutes) or S3 (in percentage of working time).

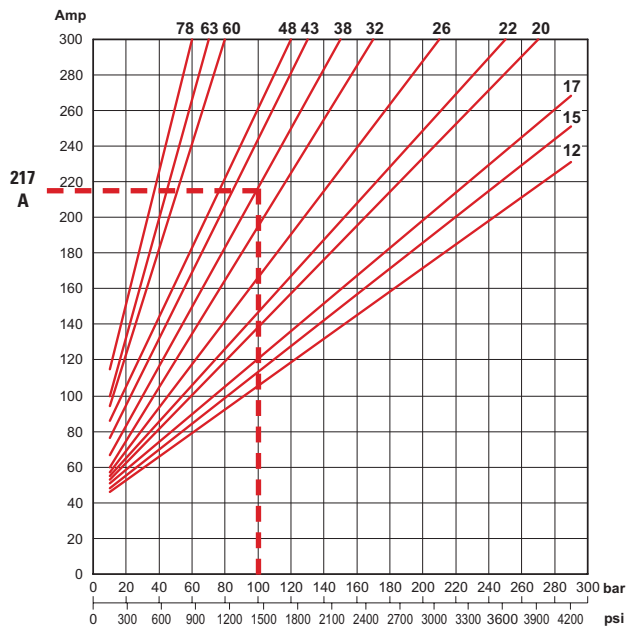
Reference data

- Maximum nominal pressure $P_{max} = 290$ Bar (4206 psi)
- Oil ISO VG32 at temperature 35°C (viscosity 40 cSt)
- Outside temperature 25°C
- Maximum nominal current $I_{max} = 300A$
- Constant stabilized voltage detected at the terminals of the electric motor.

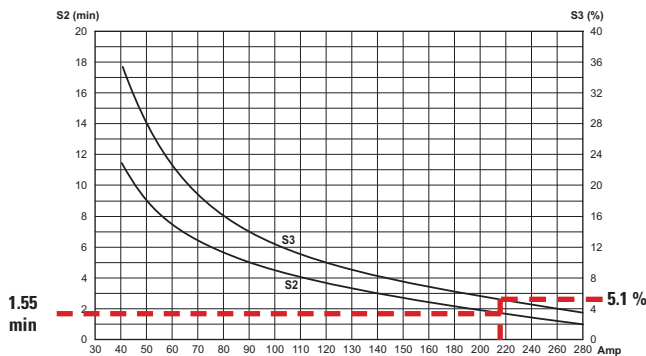
As a function of pressure and pump displacement, determines the flow rate, drawing a vertical line from the pressure value, intercepting the curve relating the pump, in fact you can read the flow rate on the ordinate. For example: pressure 100 bar (1450 psi), pump 3.8 cm³/rev (0.23 in³/rev), you have a flow rate of 10 l/min (2.6 US gpm).



Similarly you can read the value of current absorption in the related diagram. With the same data of the previous example you have a current consumption of 217 A.

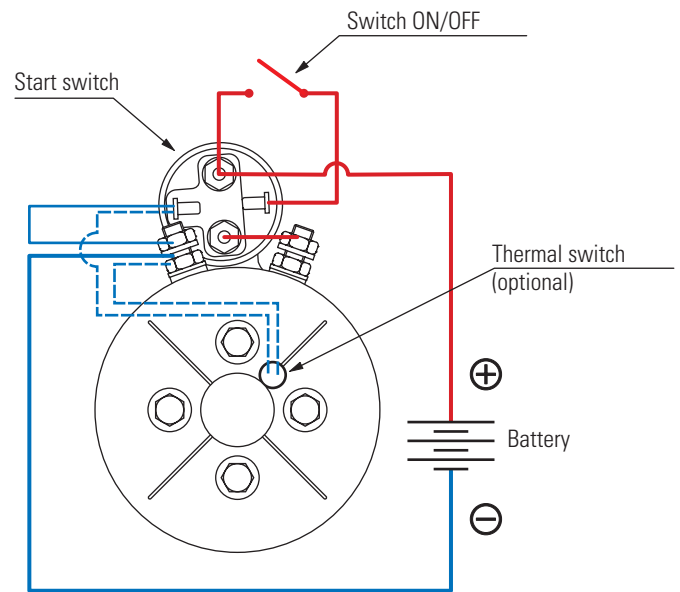


Taking again the current consumption on the S2-S3 diagram, you have a S2 duty equal to 1.55 (1'32") minutes and a S3 duty equal to 5.1 % (30 s on a cycle of 10 minutes).



Example of installation

The following is an example of electrical connection



All electrical connections and disconnections must be performed by trained, specialized personnel.

When wiring a motor, it is important to consider the cross-sectional area and length of the power cables. Cables with overly small cross-sections and overly long lengths may cause voltage drops that could prevent the PU from operating properly.

Use these tightening torque values on the motor terminals and the start switch.

ISO M8	5 ÷ 7 Nm [3.69 ÷ 5.16 lbf · ft]
ISO M6	3 ÷ 5 Nm [2.21 ÷ 3.69 lbf · ft]
5/16-18 UNC-2A	5 ÷ 7 Nm [3.69 ÷ 5.16 lbf · ft]

Unit of measure conversion

Quantity	Unit	Symbol	Other units	Symbol	Equivalence	Reverse Equivalence
Flow rate	Liters at minutes	l/min	US Gallon /minutes	US gal/min	1 US gal/min=3.7848 l/min	1 l/min = 0. 2642 US gal/min
			UK Gallon /minutes	Imp gal/min	1 Imp gal/min=4.5456 l/min	1 l/min = 0.2199 Imp gal/min
			Cubic feet /minutes	cu ft/min	1 cu ft/min= 28.32 l/min	1 l/min = 0.0353 cu ft/min
Pressure	bar	bar	Pascal	Pa	1 Pa= 10 ⁻⁵ bar	1 bar= 10 ⁵ Pa
			Atmosphere	Atm	1 atm = 1.0132 bar	1 bar= 0.9869 atm
			Kilogram force on cm ²	kgf /cm ²	1 kgf /cm ² = 0.9806 bar	1 bar= 1.0197 kgf/cm ²
			Pound force on in ²	lbf/in ² or psi	1 psi = 0.068948 bar	1 bar= 14.5038 psi

Main formulae

Flow rate from pump

$$Q[l/min] = V[cm^3/rev] \cdot n[rpm] \cdot \eta_{vol} \cdot 10^{-3}$$

V = displacement (cm³/rev)

Torque absorbed by pump

$$T[Nm] = \frac{V[cm^3/rev] \cdot \Delta P [bar]}{20\pi \cdot \eta_{mecc}}$$

Q = flow rate (l/min)

T = torque (Nm)

N = power (kW)

n = speed (rpm)

ΔP = pressure difference between inlet and outlet (bar)

Power absorbed by pump

$$N[kW] = \frac{2\pi \cdot 10^{-3} \cdot T[Nm] \cdot n[rpm]}{60} = \frac{Q[l/min] \cdot \Delta P [bar]}{600 \cdot \eta_{tot}}$$

η_{mecc} = mechanical efficiency

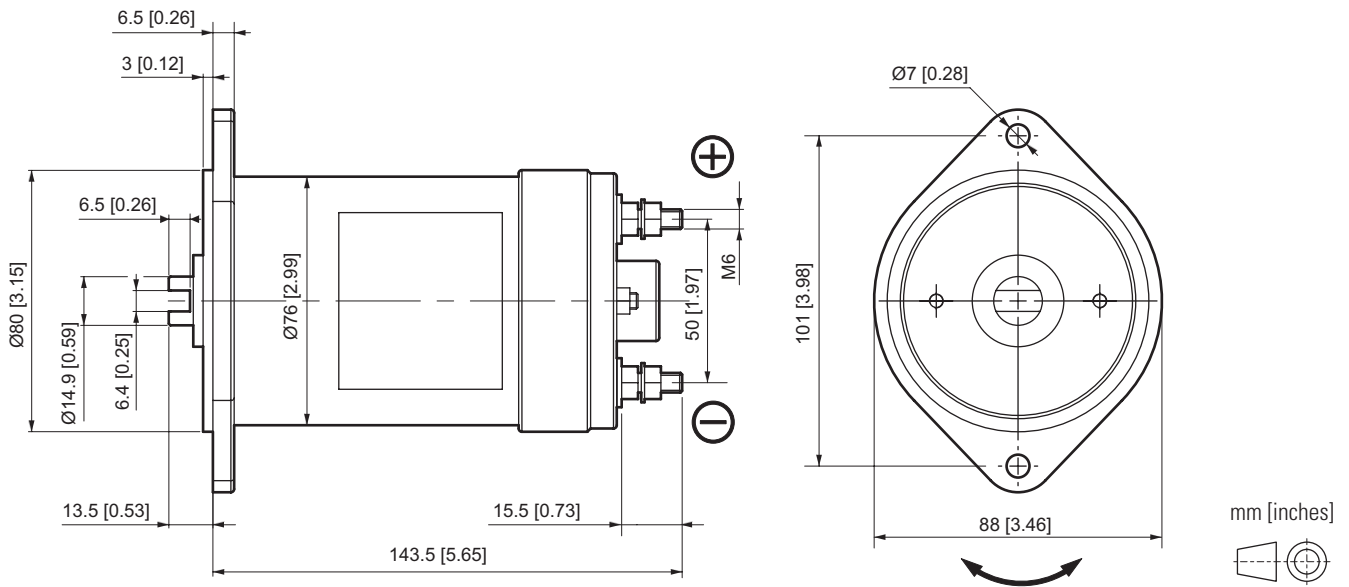
η_{vol} = volumetric efficiency

η_{tot} = total efficiency

Total efficiency

$$\eta_{tot} = \eta_{mecc} \cdot \eta_{vol}$$

12VDC MOTOR - D.80



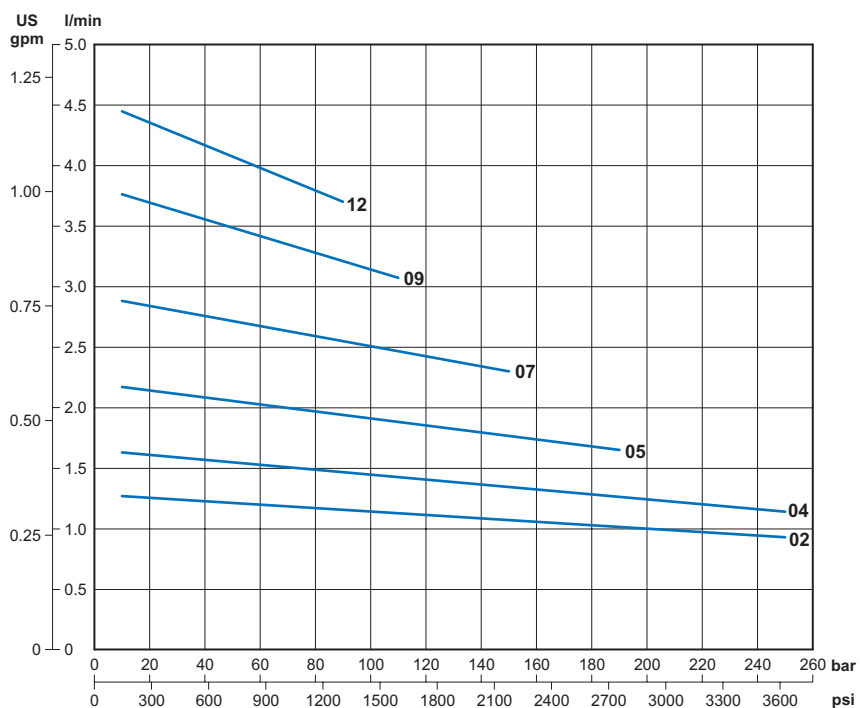
RATED FEATURES

Voltage	12 VDC
Power	0.35 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.2 kg [4.85 lb]

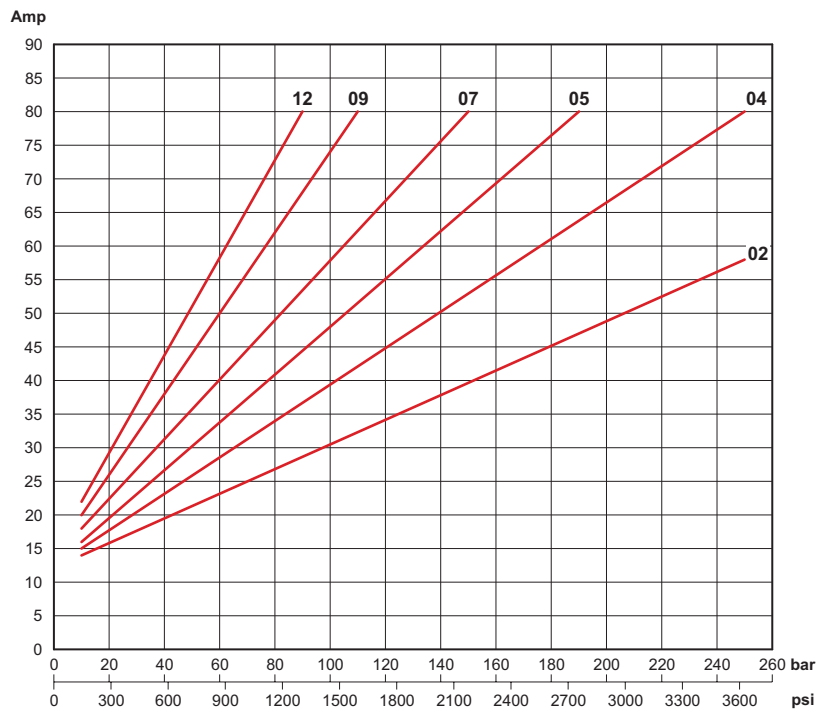
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

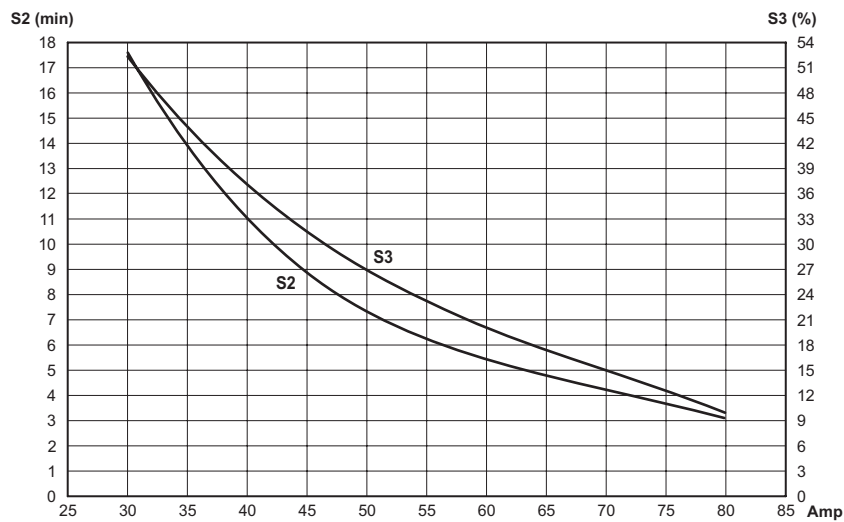
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



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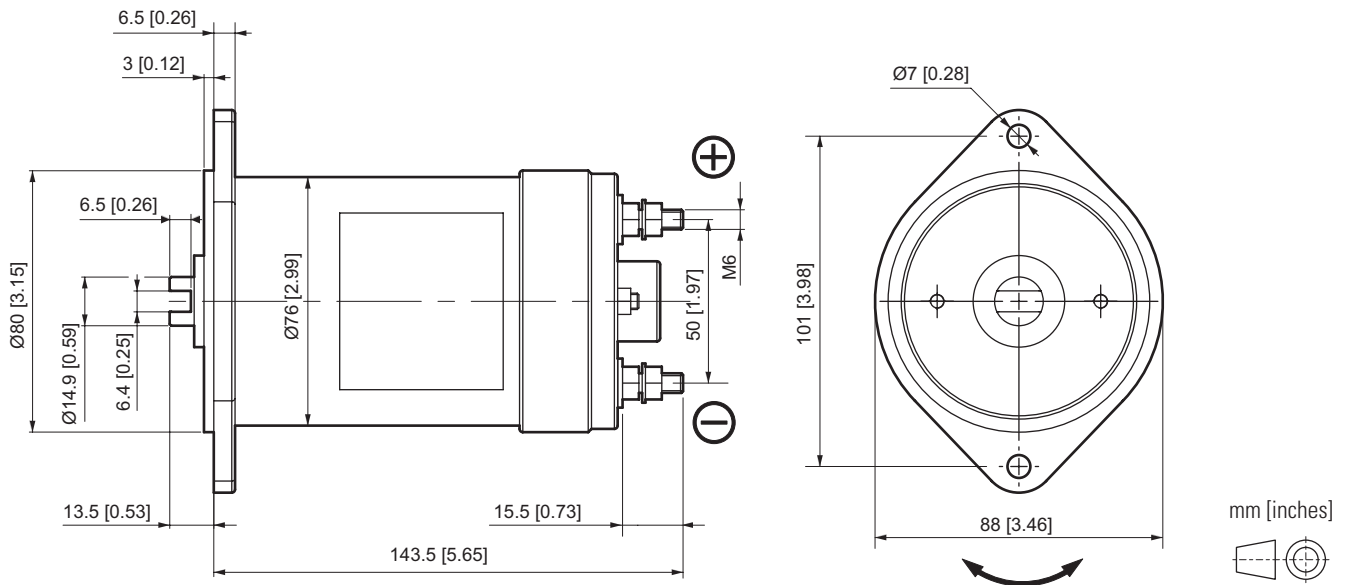
Code	Description
25021400	12VDC motor - 0.35 kW

Code	Description
KIT07012.027	Starting switch kit 12VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure P_{max} = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 80A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.80



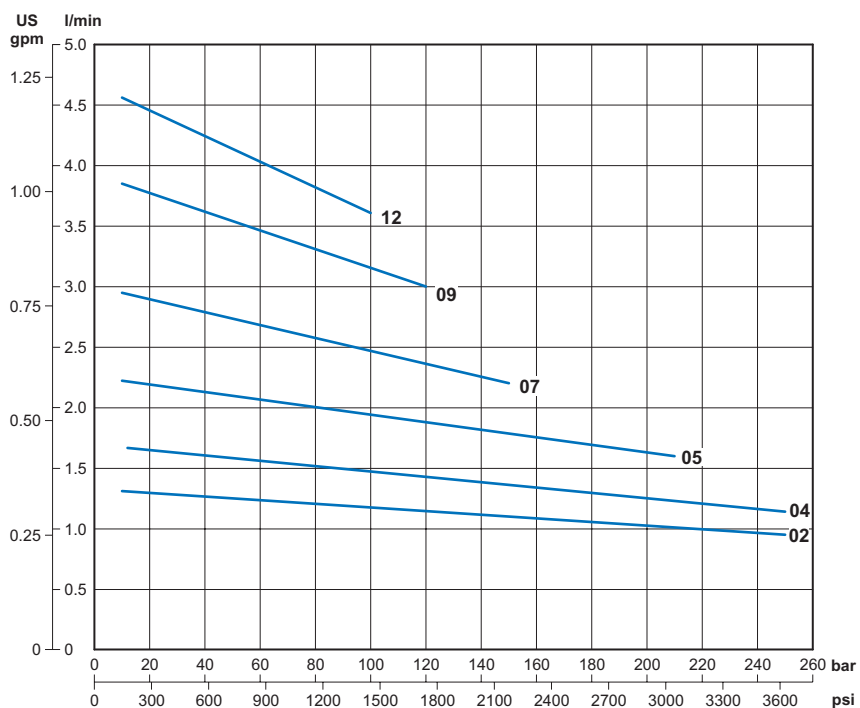
RATED FEATURES

Voltage	24 VDC
Power	0.4 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.2 kg [4.85 lb]

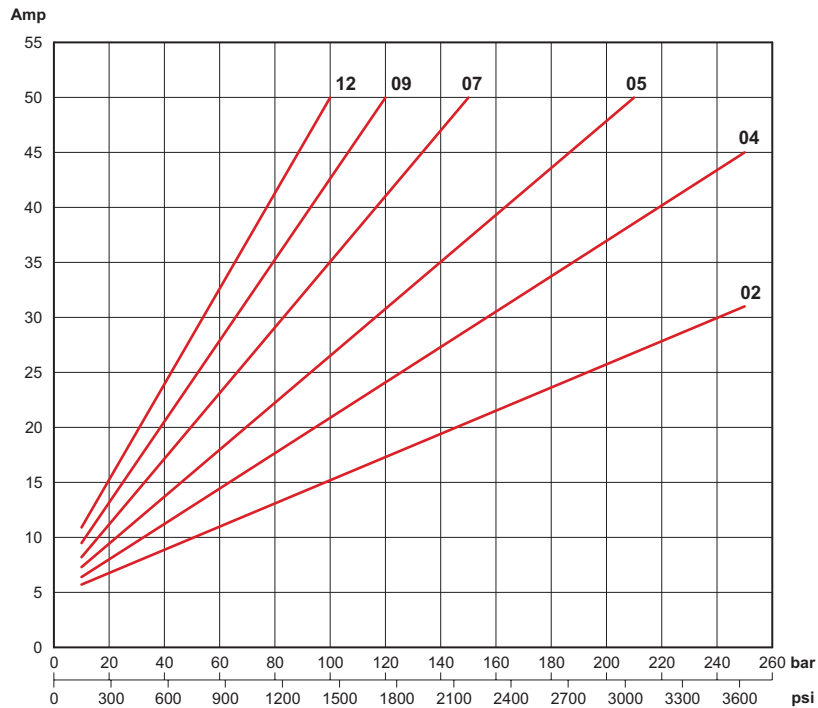
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

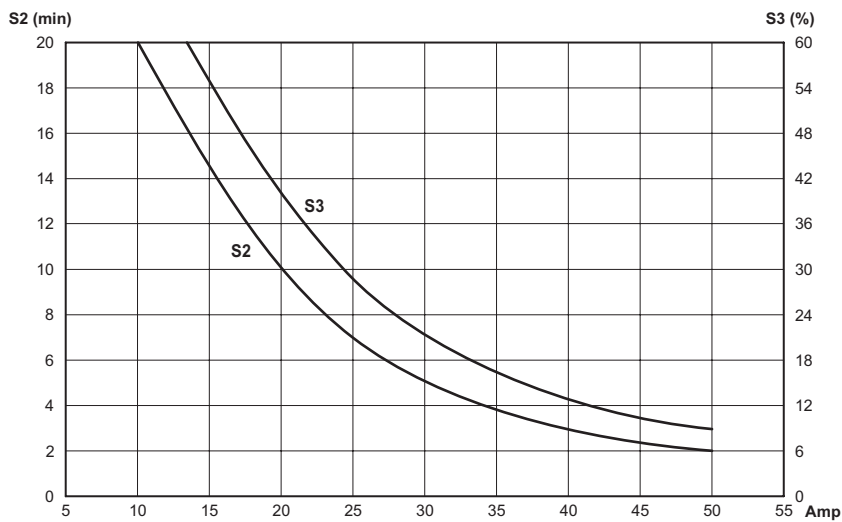
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



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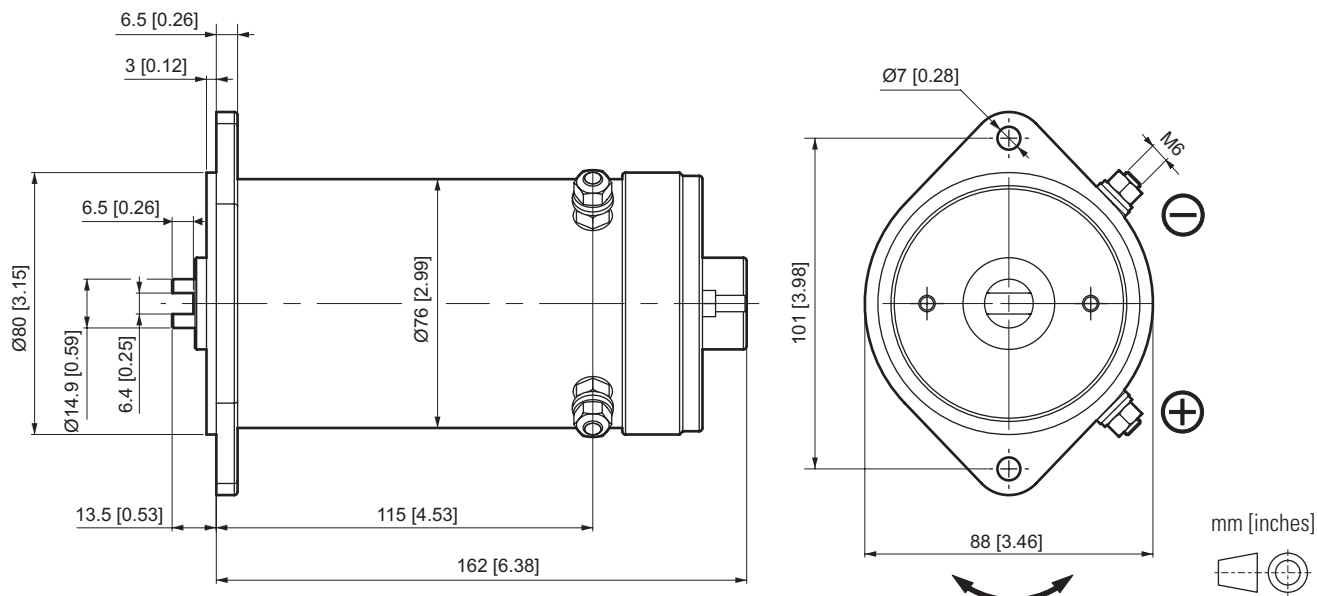
Code	Description
25021500	24VDC motor - 0.4 kW

Code	Description
KIT07012.032	Starting switch kit 24VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure P_{max} = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 50A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

12VDC MOTOR - D.80



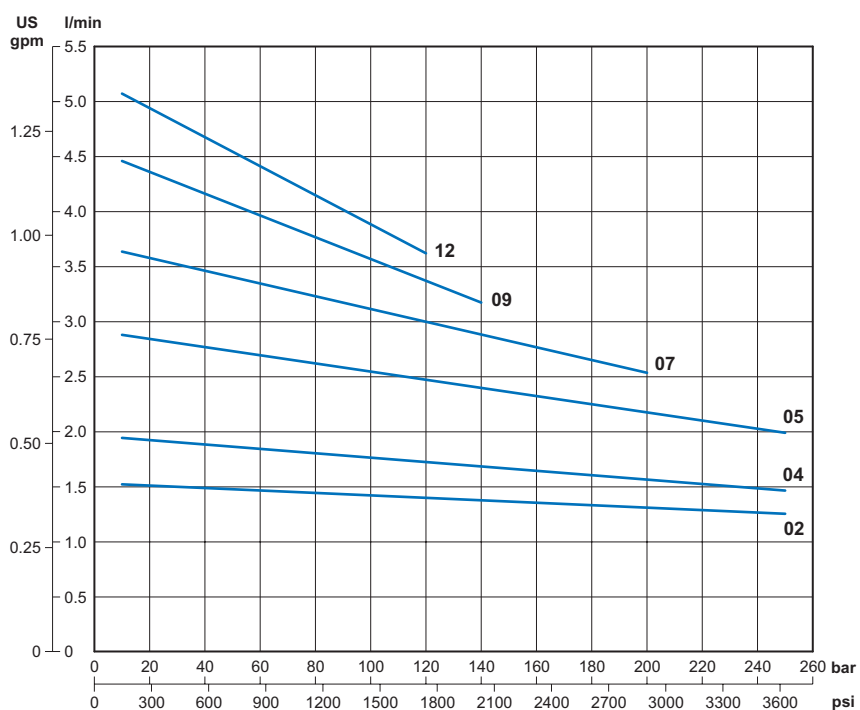
RATED FEATURES

Voltage	12 VDC
Power	0.7 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.7 kg [5.95 lb]

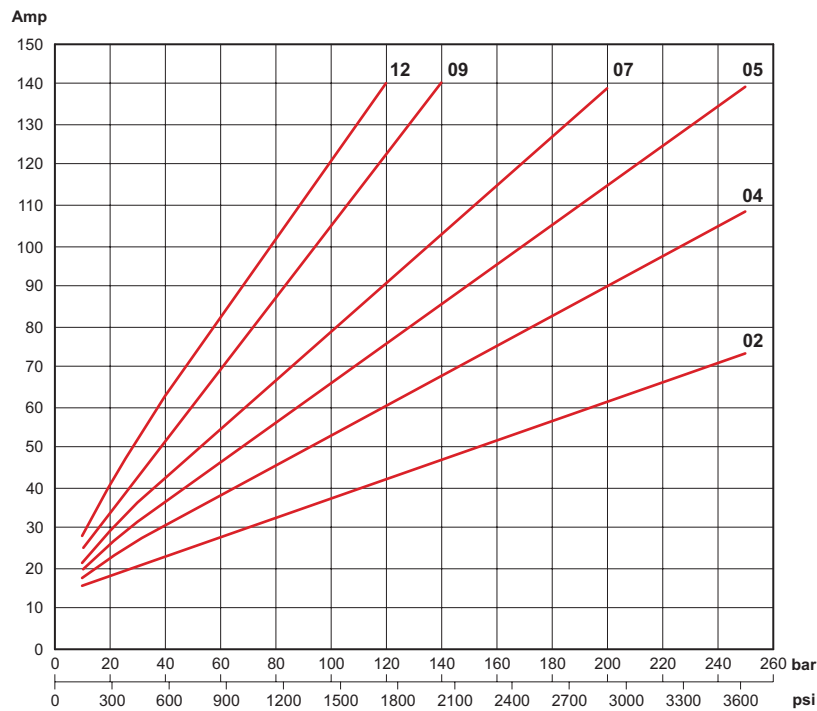
PUMP TYPE

Code	cc/rev.	GR (Size)
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04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

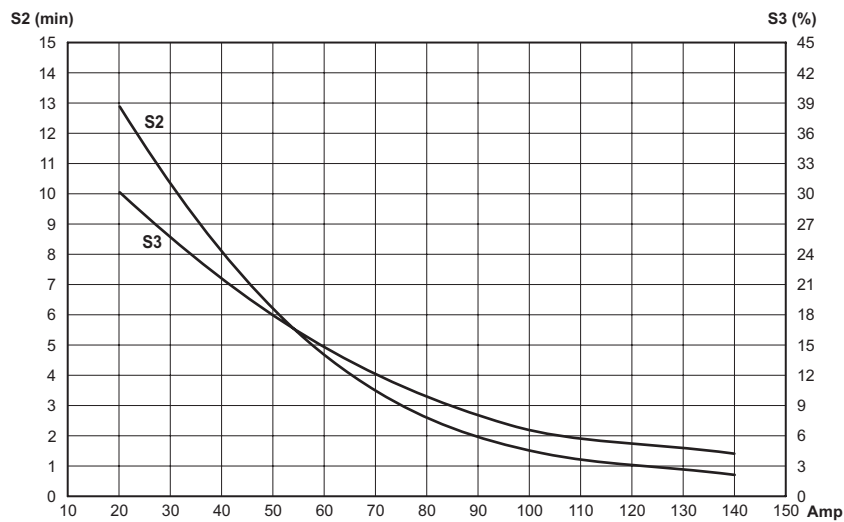
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

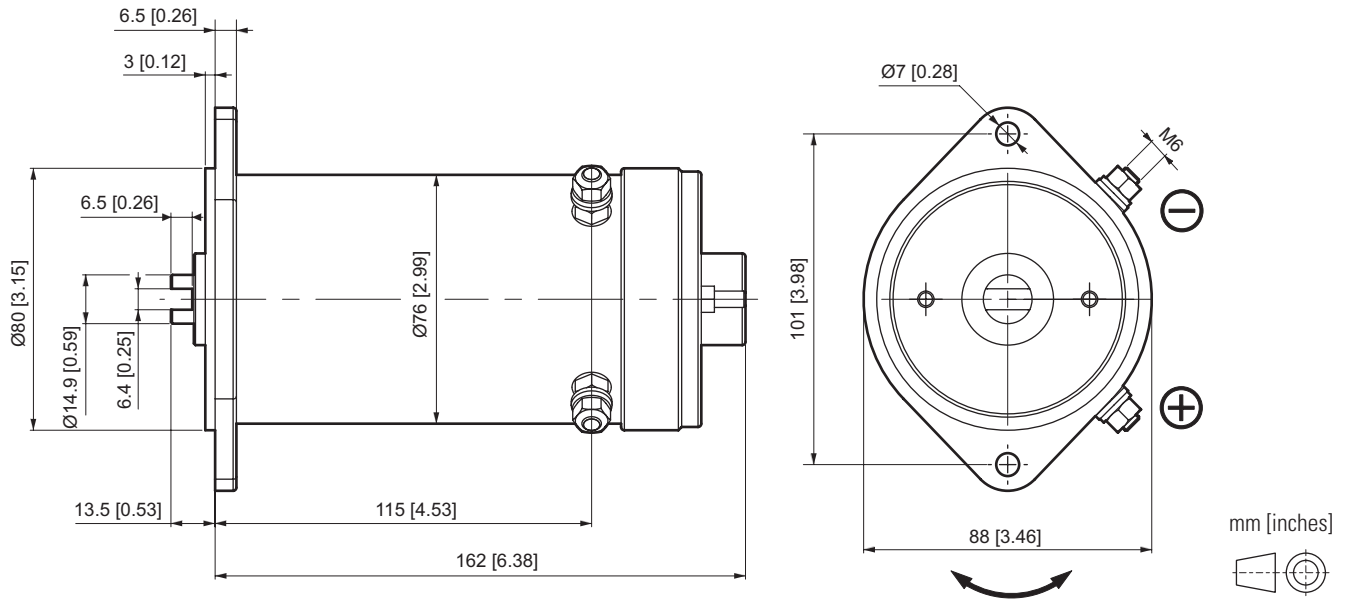
Code	Description
25021700	12VDC motor - 0.7 kW

Code	Description
KIT07012.027	Starting switch kit 12VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 140A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.80



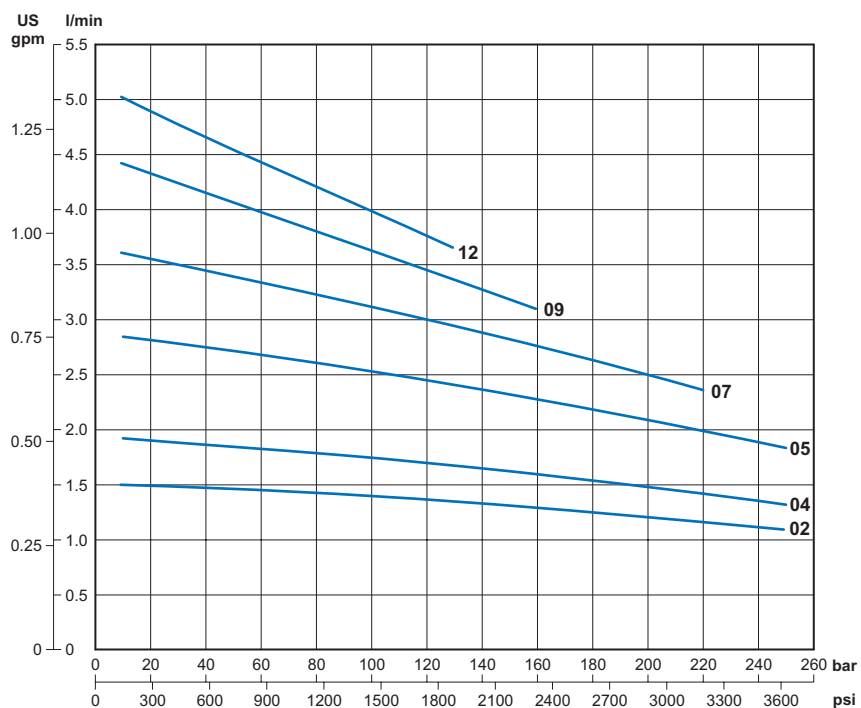
RATED FEATURES

Voltage	24 VDC
Power	0.8 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.7 kg [5.95 lb]

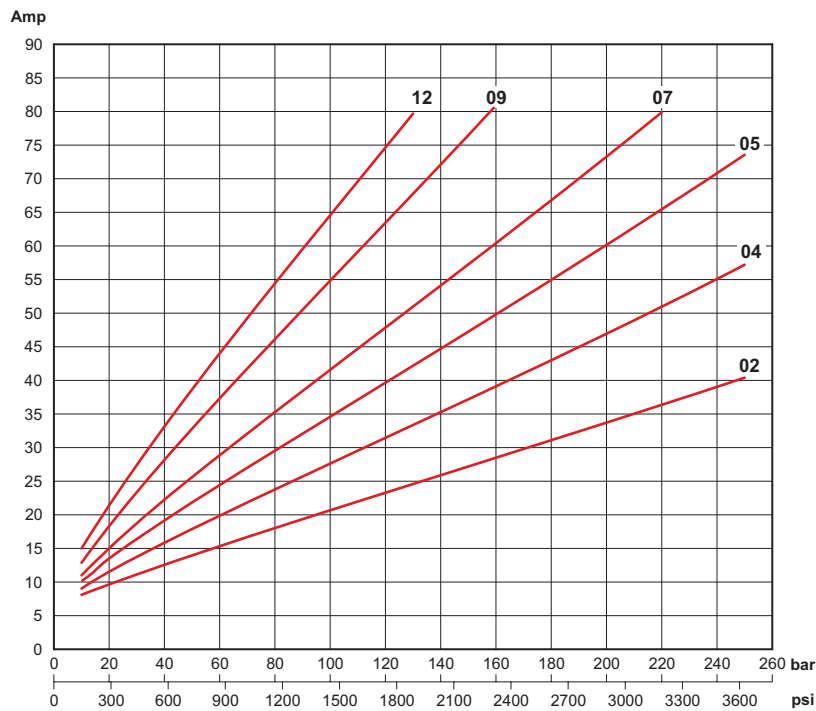
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

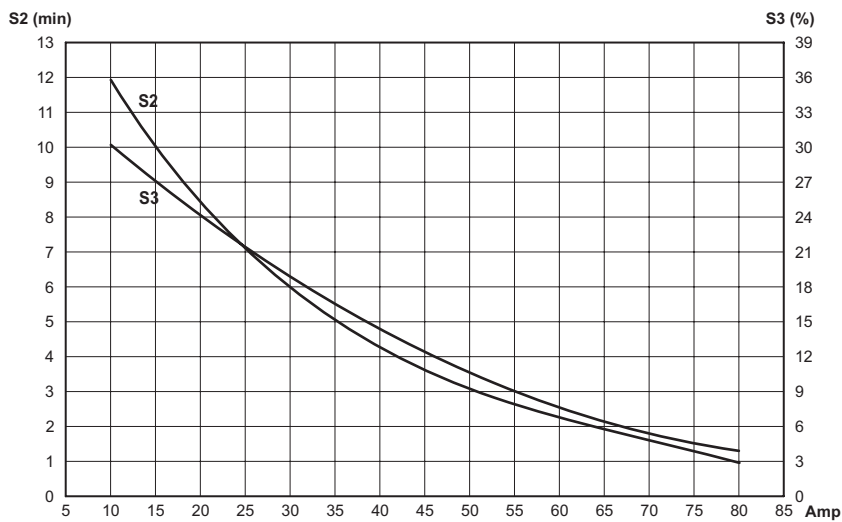
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

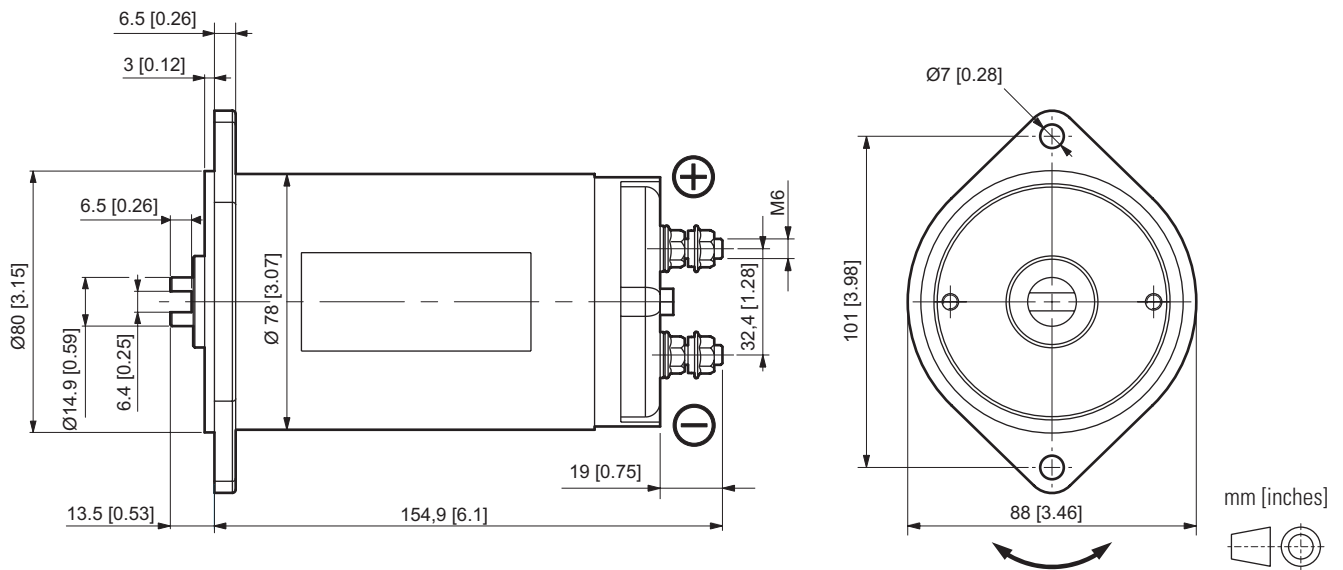
Code	Description
25021700	24VDC motor - 0.8 kW

Code	Description
KIT07012.032	Starting switch kit 24VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 80A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

12VDC MOTOR - D.80



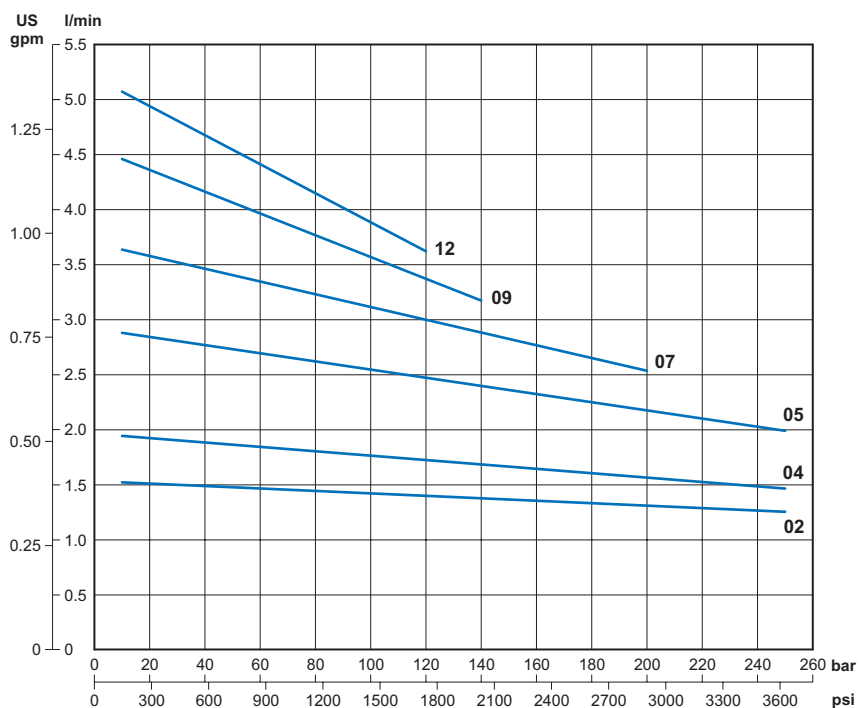
RATED FEATURES

Voltage	12 VDC
Power	0.8 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.5 kg [5.51 lb]

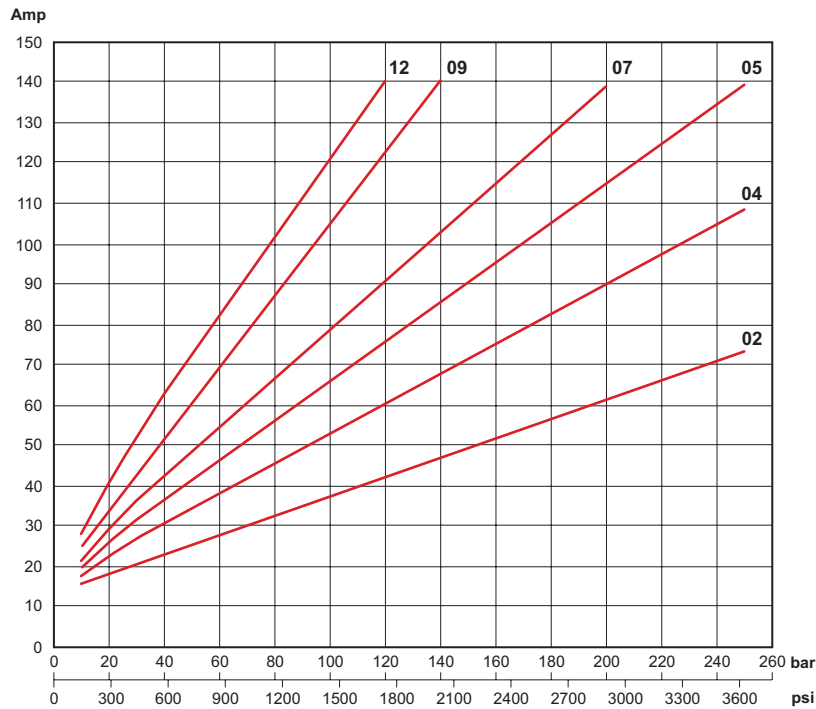
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

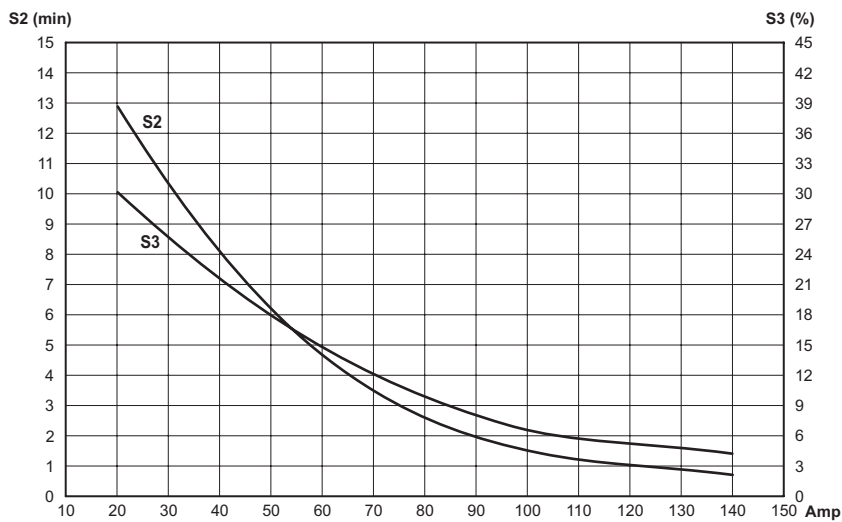
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

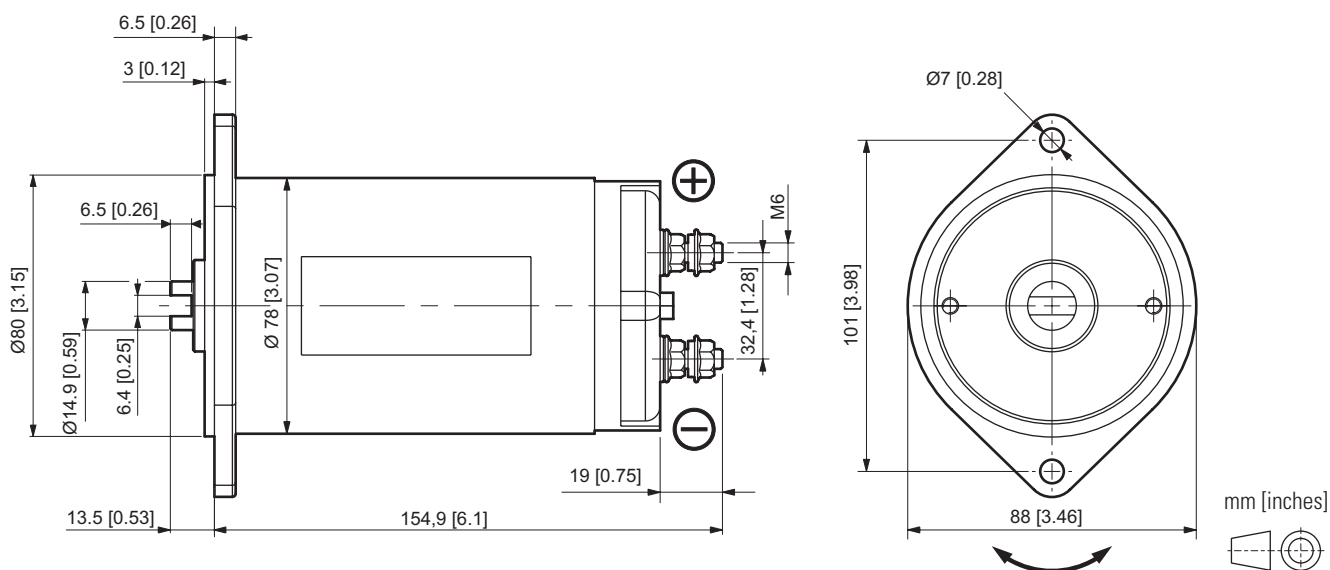
Code	Description
25021800	12VDC motor - 0.8 kW

Code	Description
KIT07012.027	Starting switch kit 12VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 140A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.80



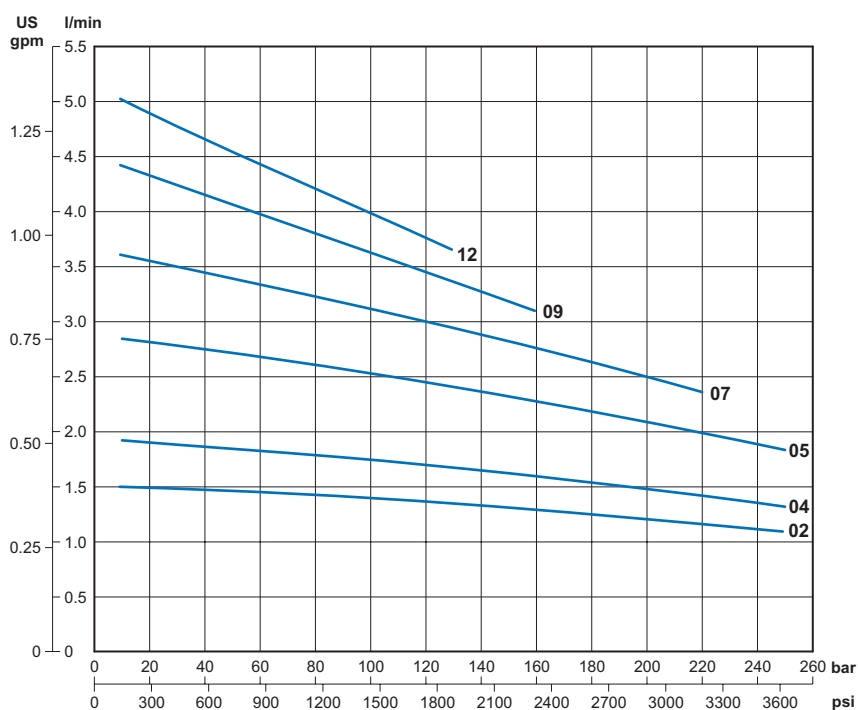
RATED FEATURES

Voltage	24 VDC
Power	0.8 kW
Nominal diameter	80 mm [3.15 in]
Motor type	Permanent magnet
Rotation	CCW-CW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	2.5 kg [5.51 lb]

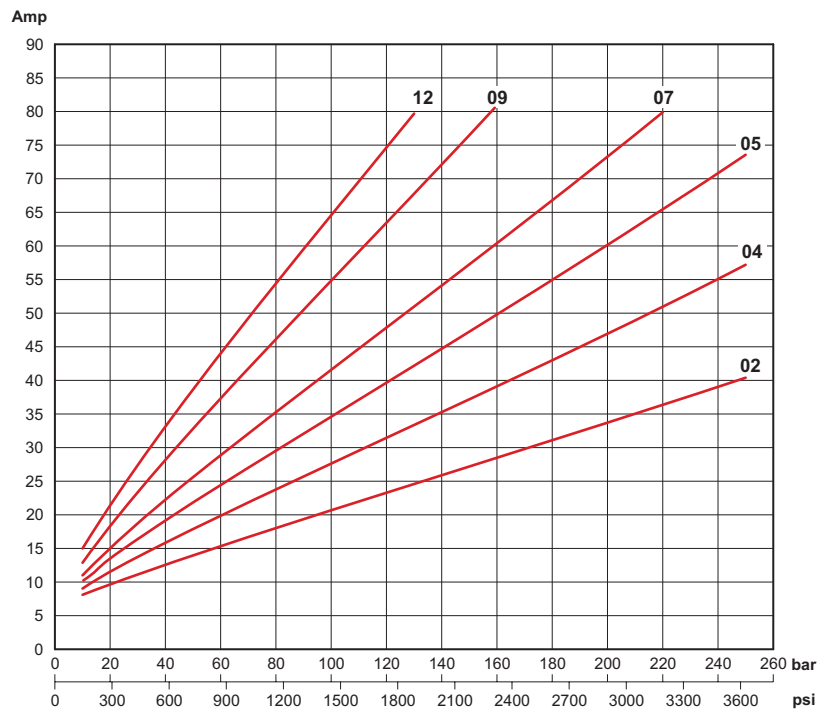
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
12	1.2	05/1

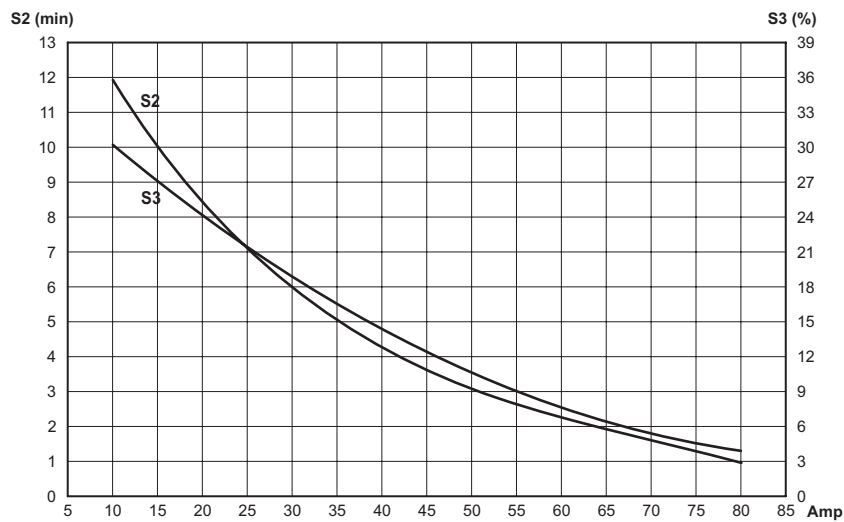
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.2 cc/rev [0.012 ÷ 0.073 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

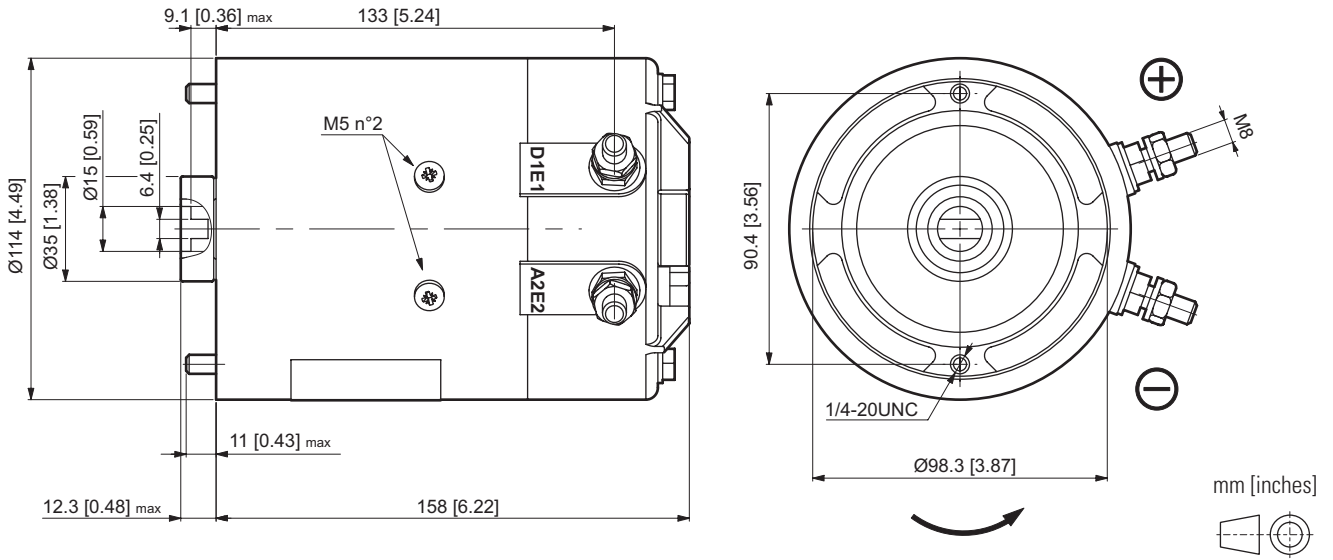
Code	Description
25021900	24VDC motor - 0.8 kW

Code	Description
KIT07012.032	Starting switch kit 24VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 80A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

12VDC MOTOR - D.115



RATED FEATURES

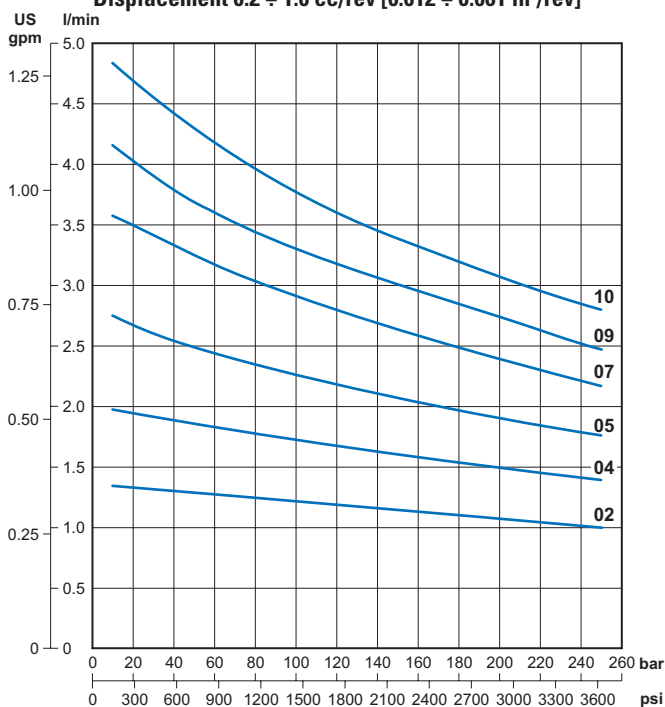
Voltage	12 VDC
Power	1.6 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

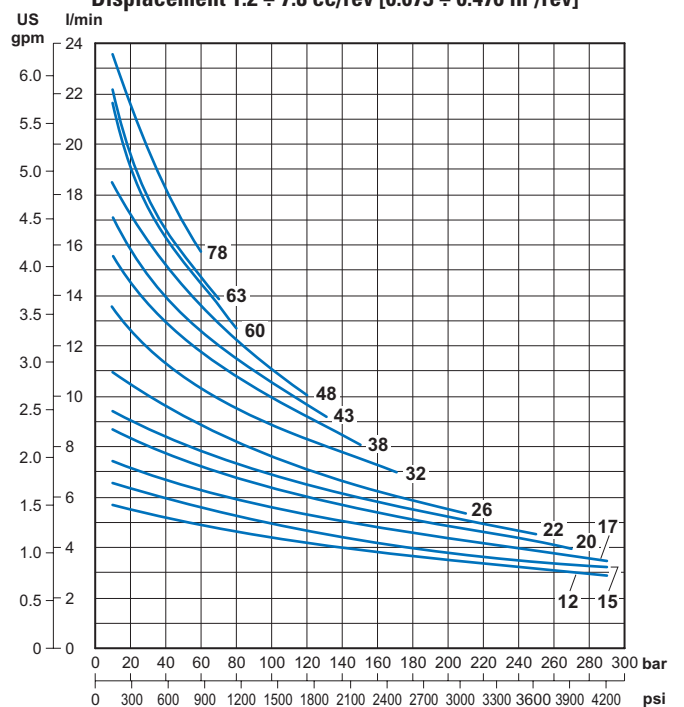
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

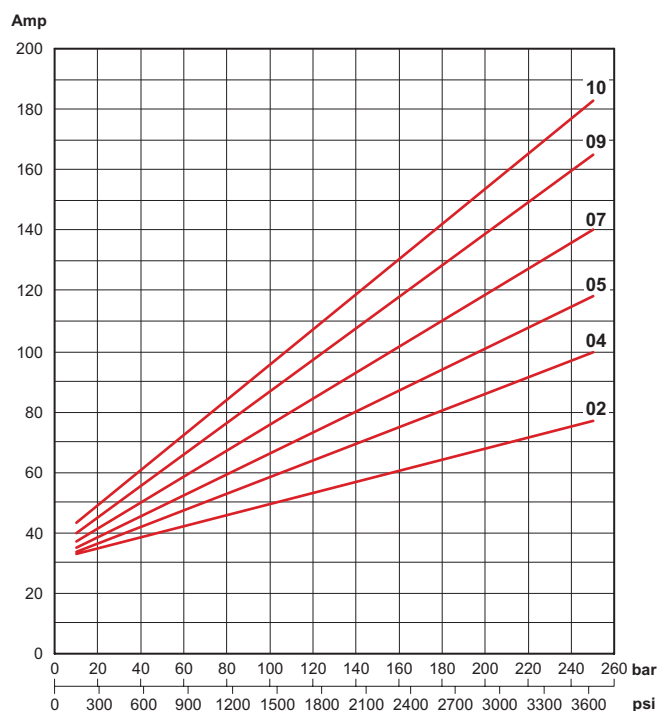
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



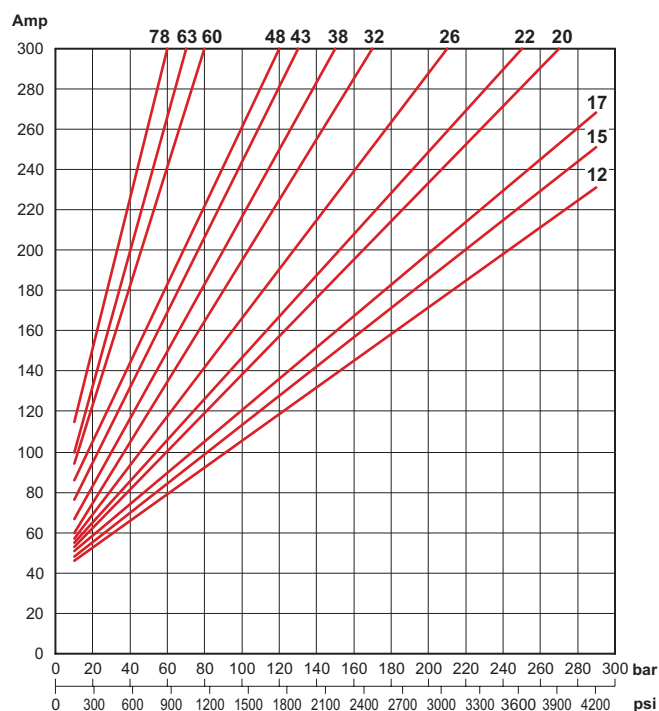
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



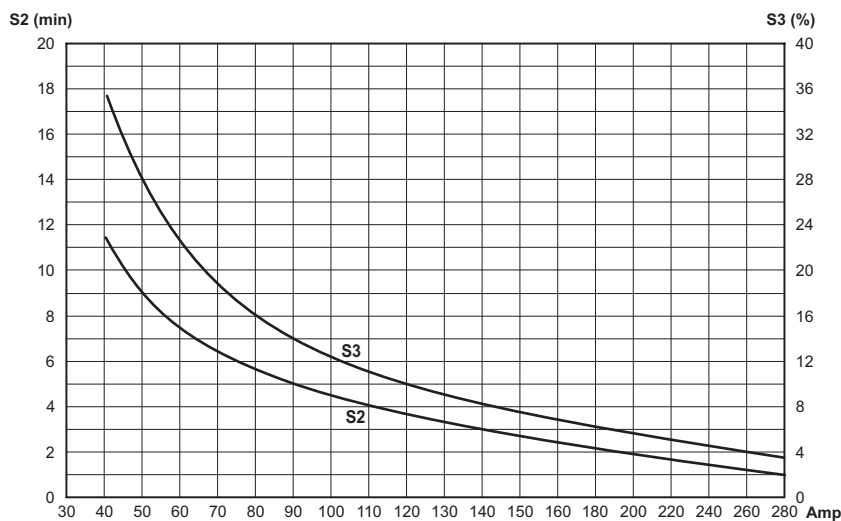
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



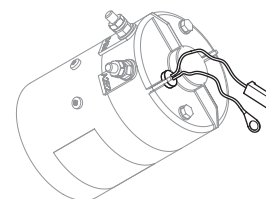
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

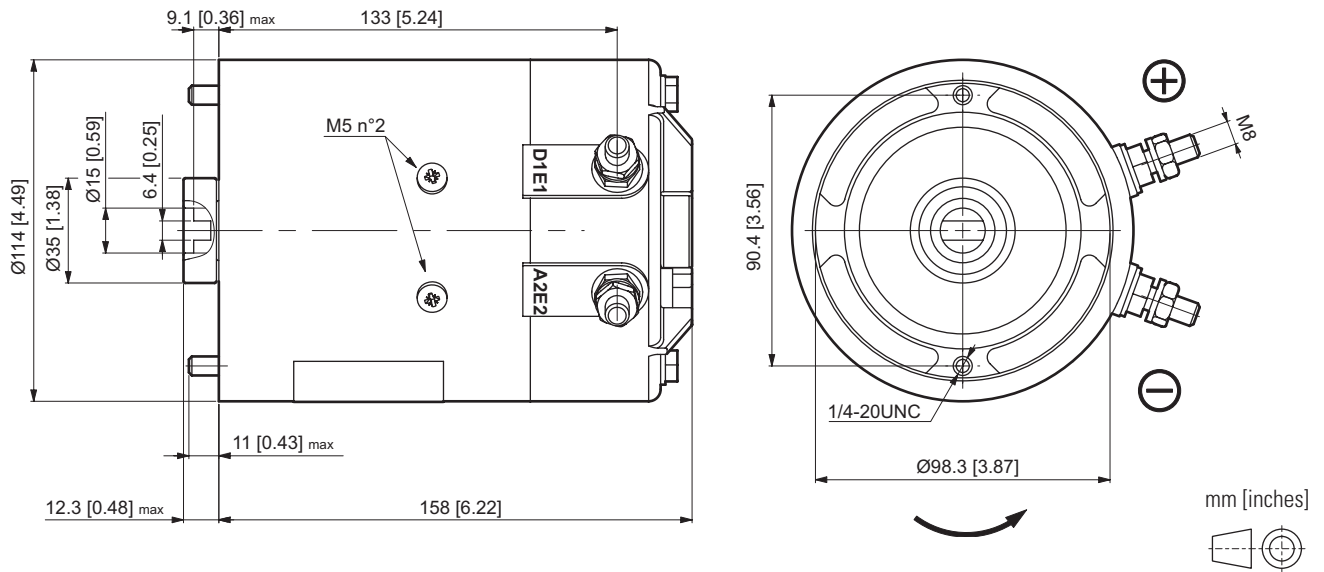
Code	Description
25021100	12VDC motor - 1.6 kW
25016600	12VDC motor - 1.6 kW with thermal switch
90340008	Thermal switch

Code	Description
KIT07012.025	Starting switch kit 12VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 250 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 140A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.115



RATED FEATURES

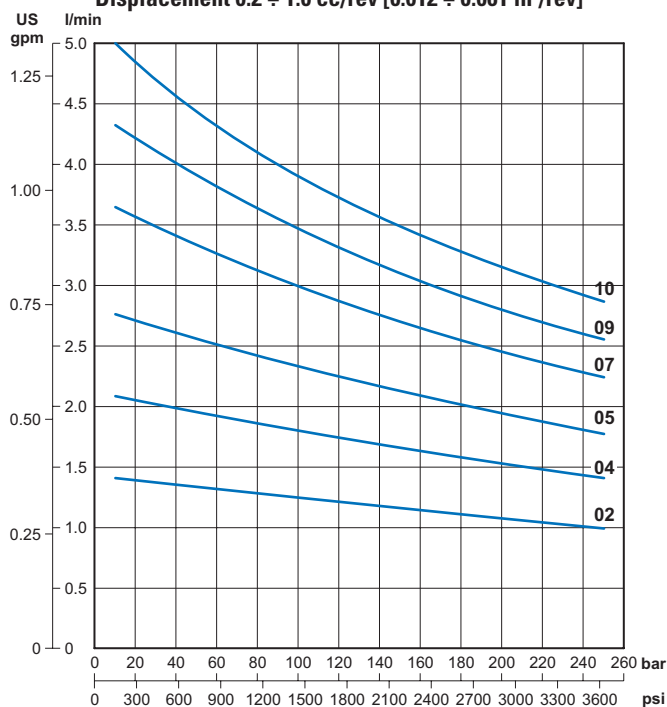
Voltage	24 VDC
Power	2.2 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

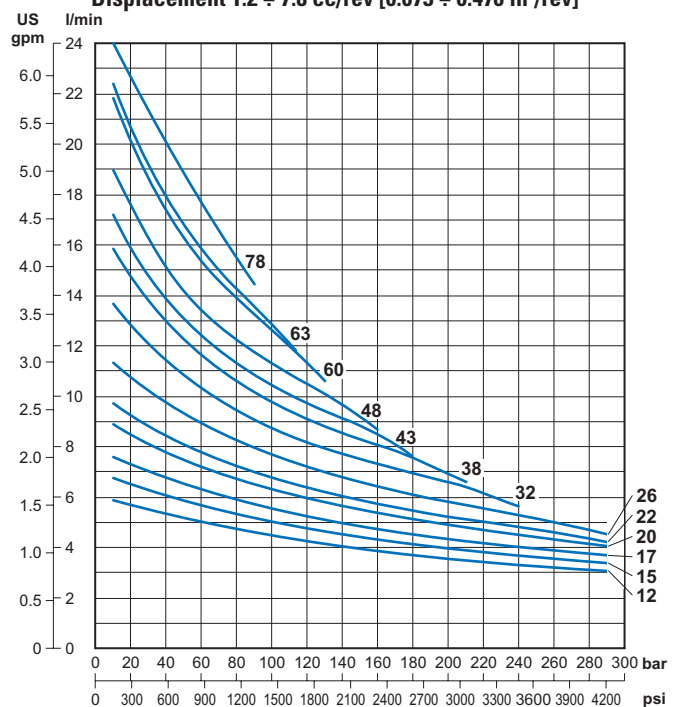
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

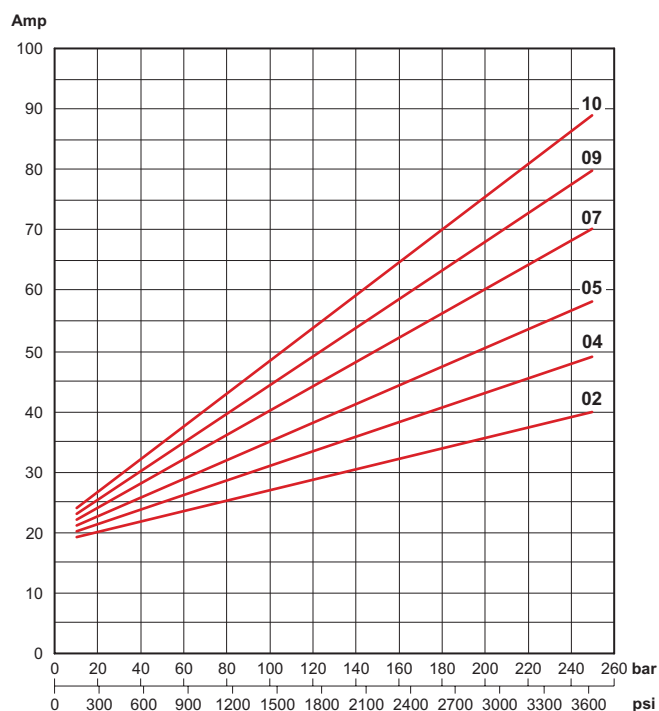
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



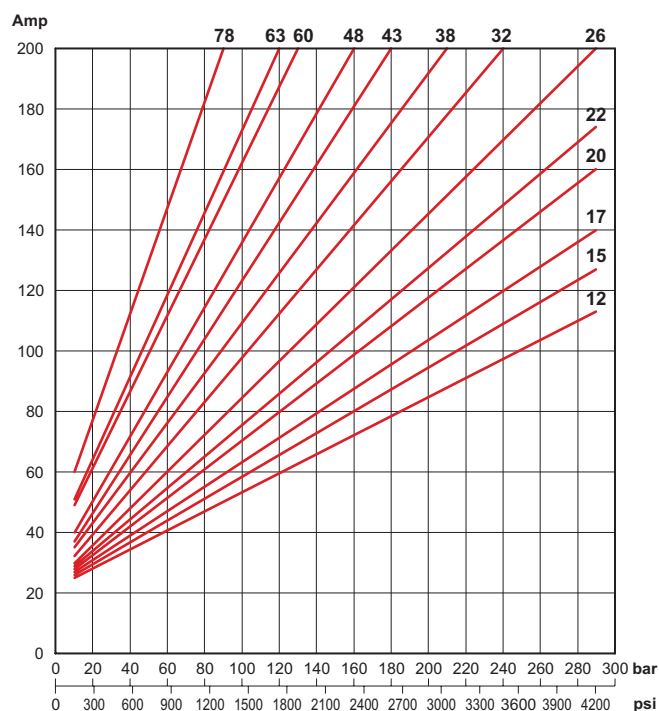
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



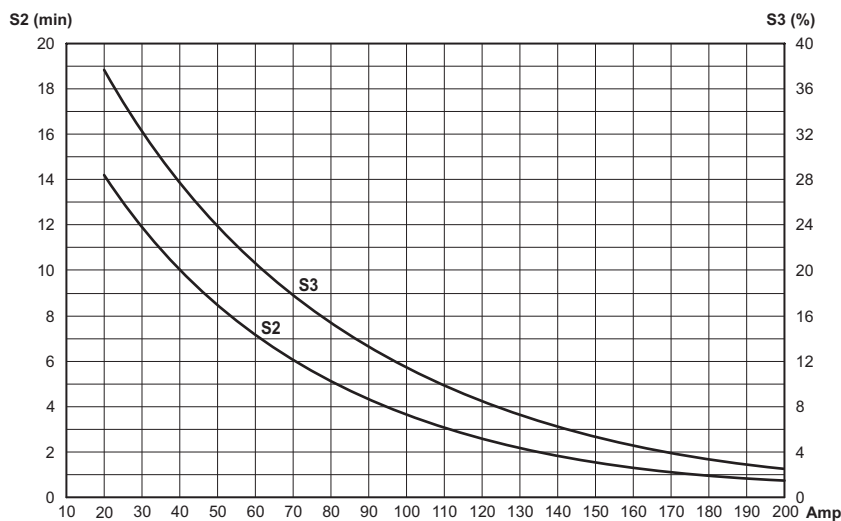
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



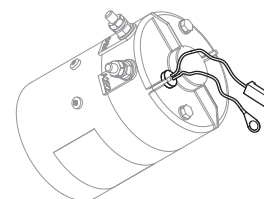
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

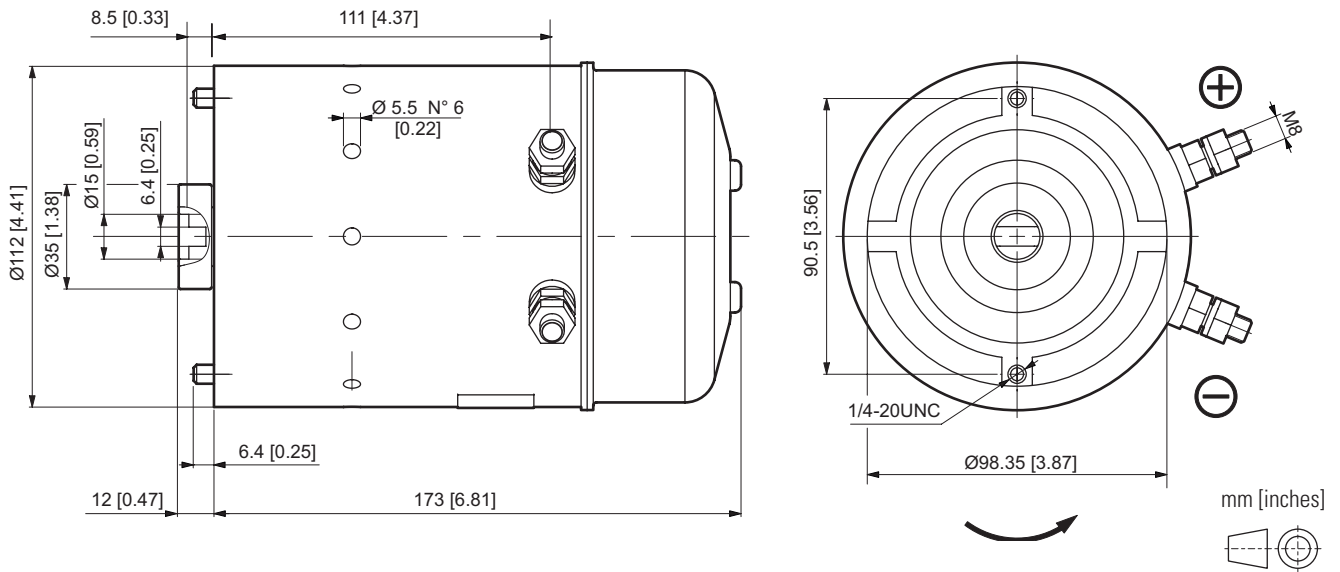
Code	Description
25021200	24VDC motor - 2.2 kW
25016700	24VDC motor - 2.2 kW with thermal switch
90340008	Thermal switch

Code	Description
KIT07012.026	Starting switch kit 24VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 200A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

12VDC MOTOR - D.115



RATED FEATURES

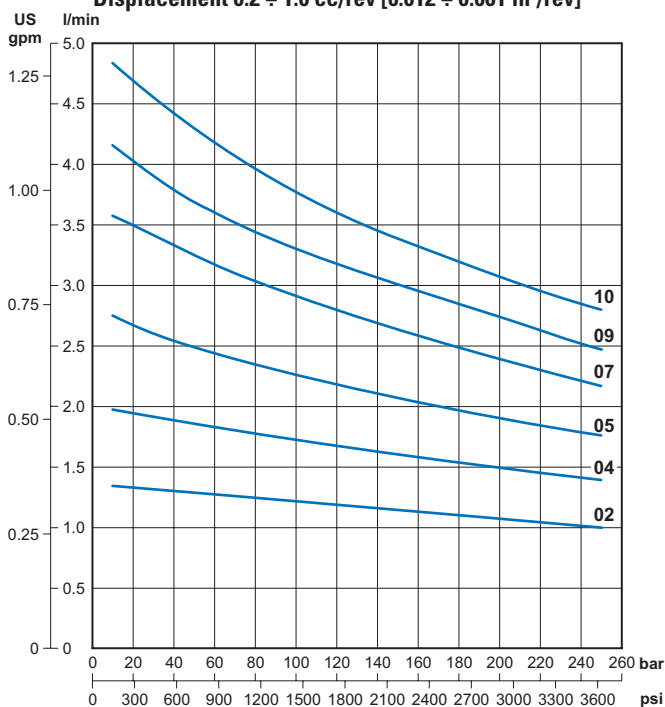
Voltage	12 VDC
Power	1.5 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

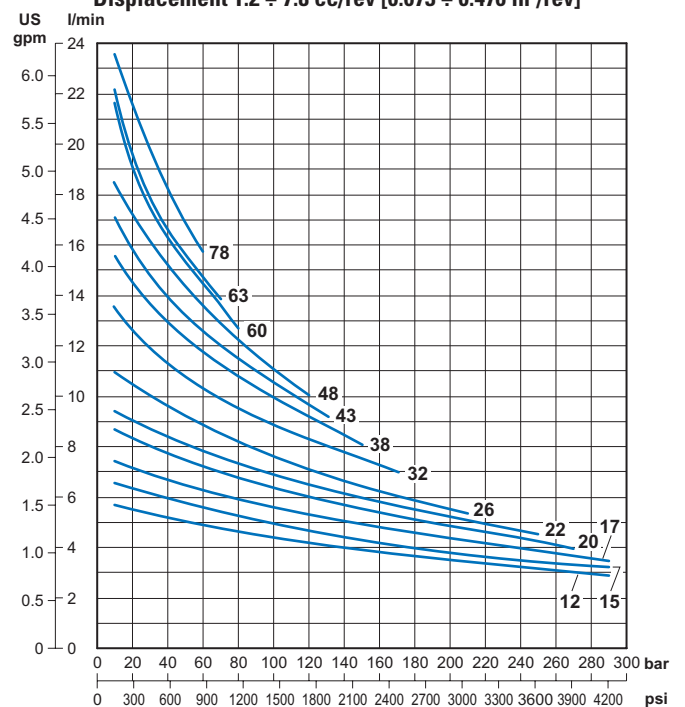
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

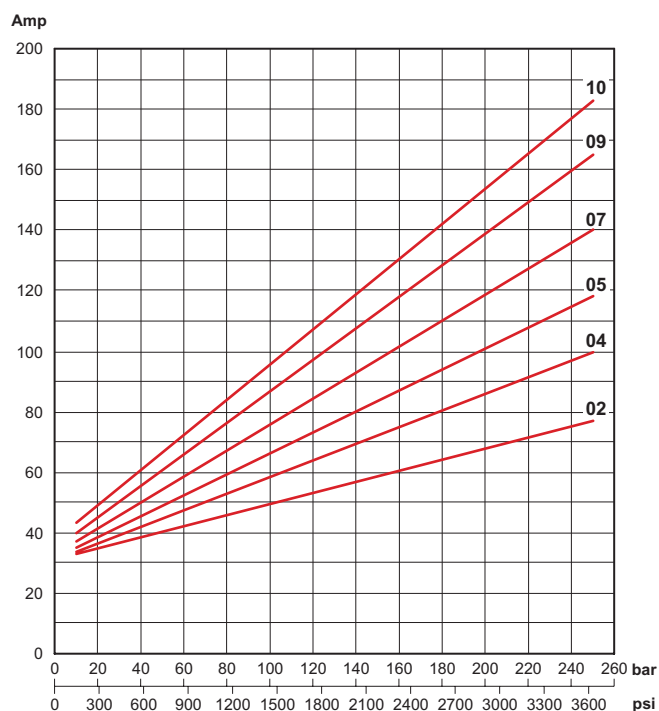
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



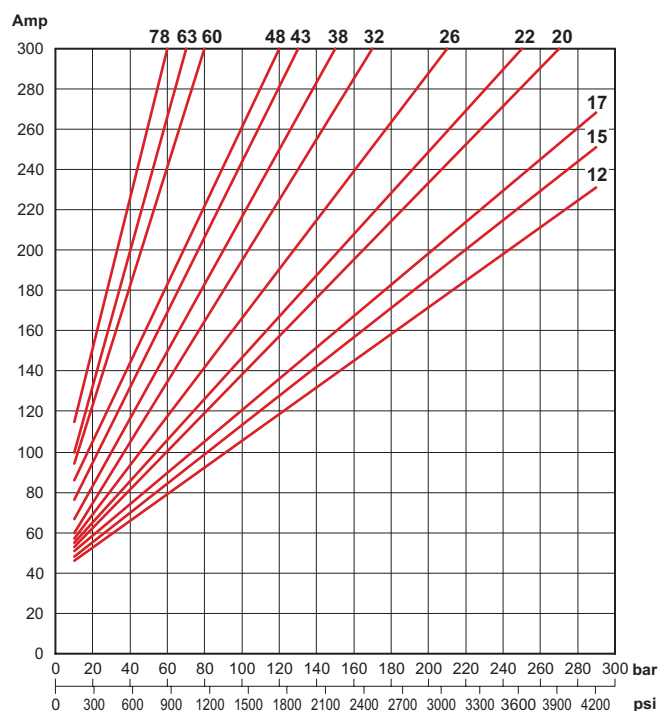
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



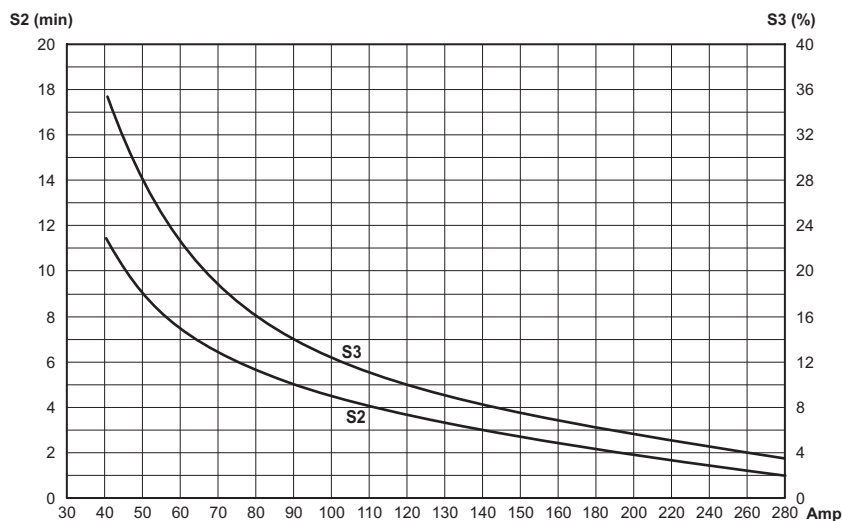
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

Code	Description
25022200	12VDC motor - 1.5 kW

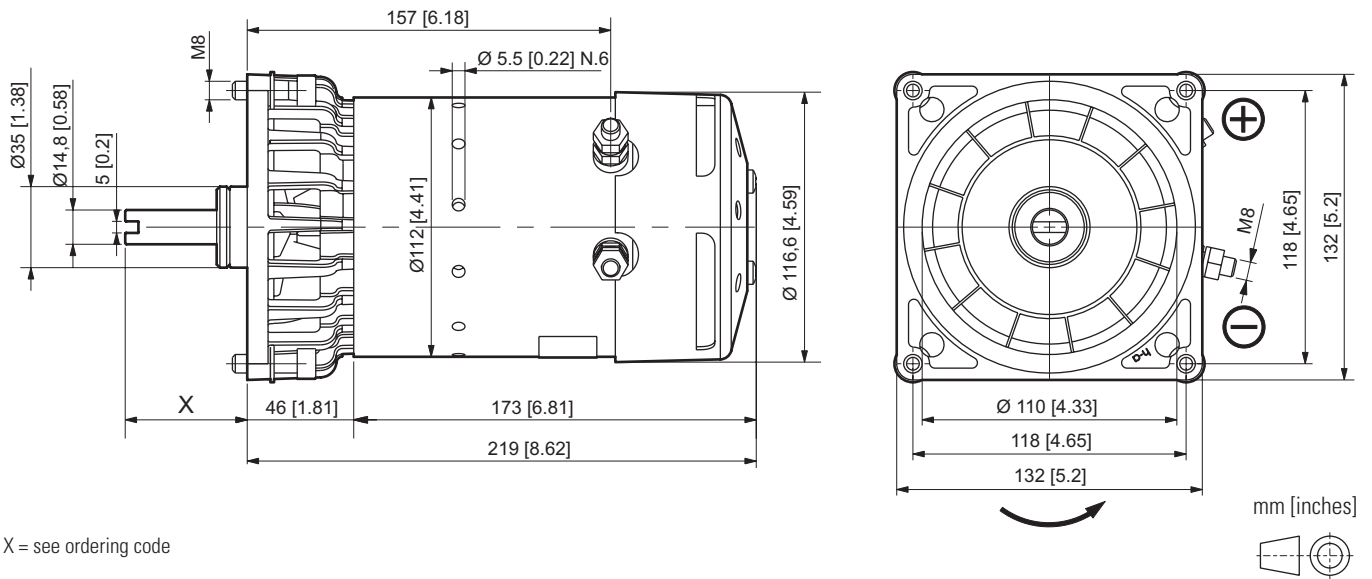
Code	Description
KIT07012.033	Starting switch kit 12VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

25022200 FAN

12VDC MOTOR - D.115



X = see ordering code

RATED FEATURES

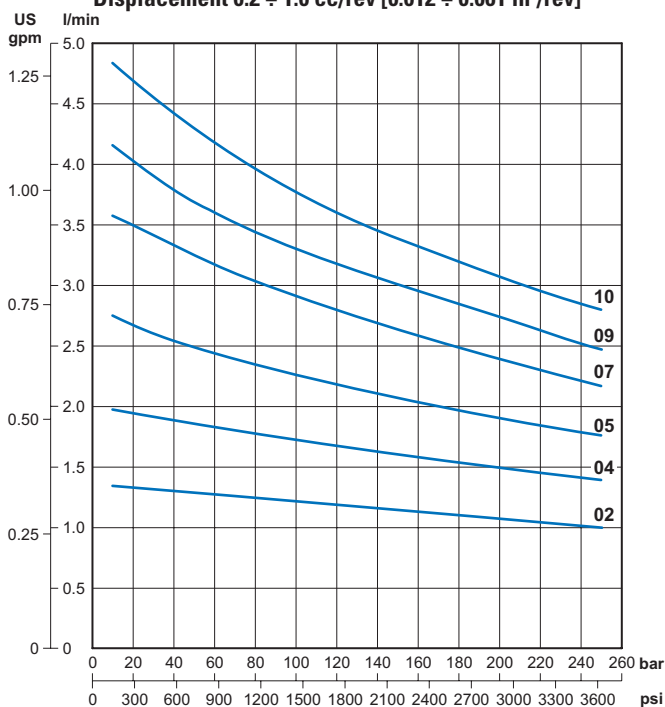
Voltage	12 VDC
Power	1.5 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	7.4 kg [16.31 lb]

PUMP TYPE

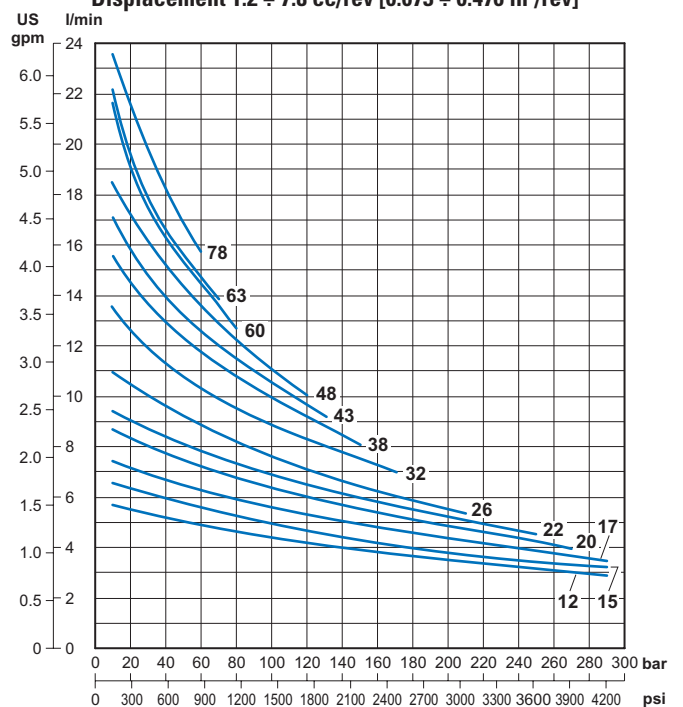
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]

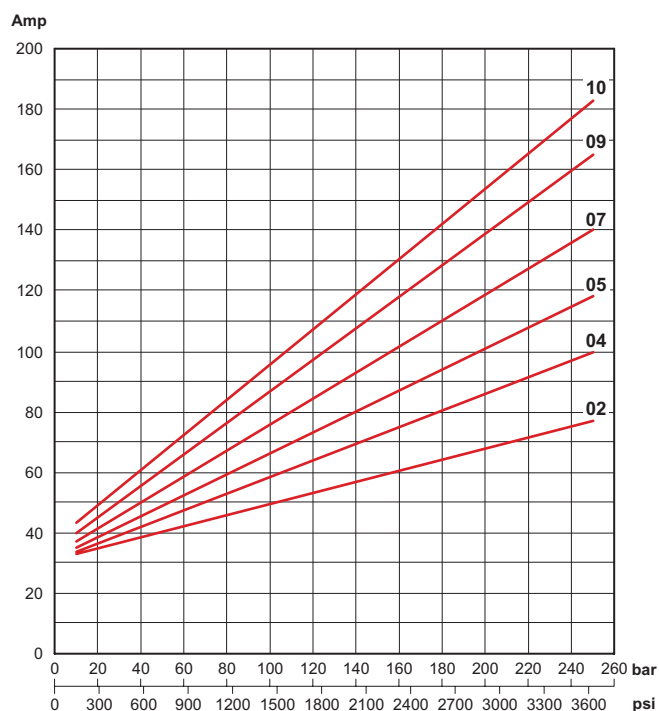


Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]

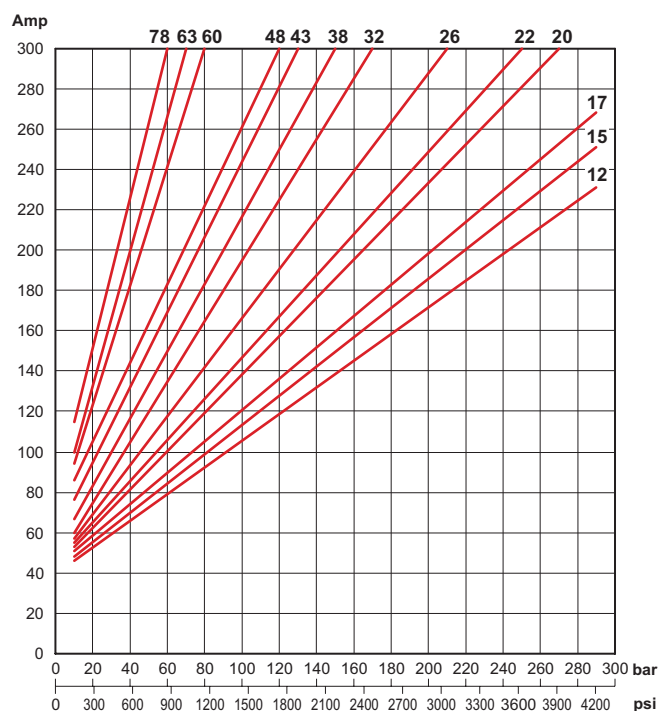


25022200 FAN

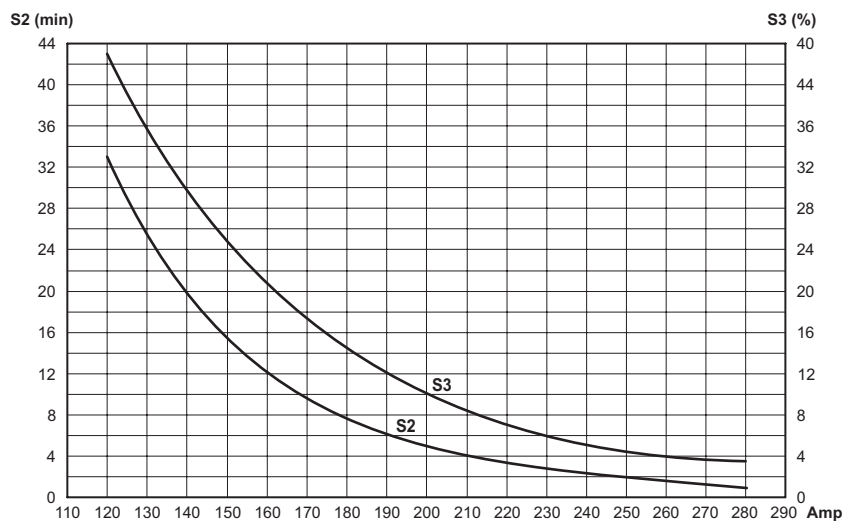
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



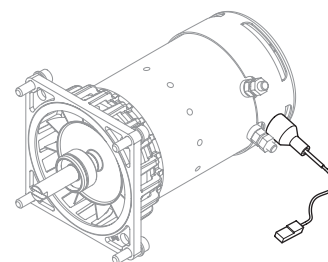
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

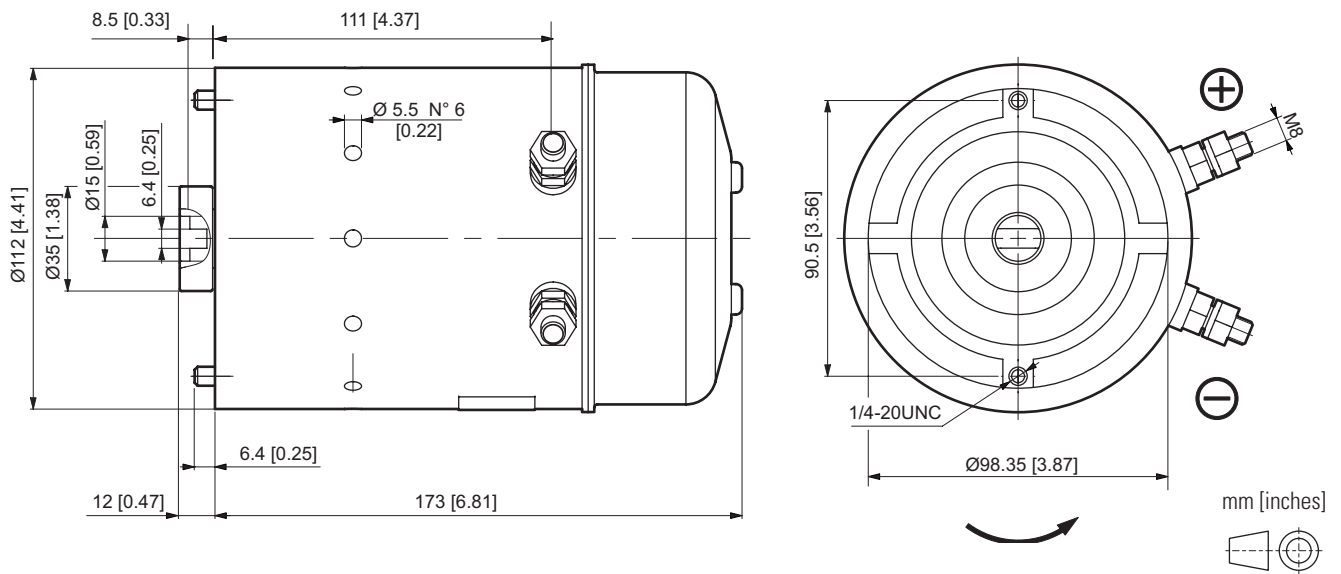
Power pack	X mm [inch]	Code Fan cooled motor	Code Fan cooled motor with thermal switch	Code Fan cooled kit
FP	52.6 [2.07]	KIT09008.061	KIT09008.062	25017800
MC	41.6 [1.64]	KIT01008.065	KIT01008.088	25002300

Code	Description
KIT07012.033	Starting switch kit 12VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.115



RATED FEATURES

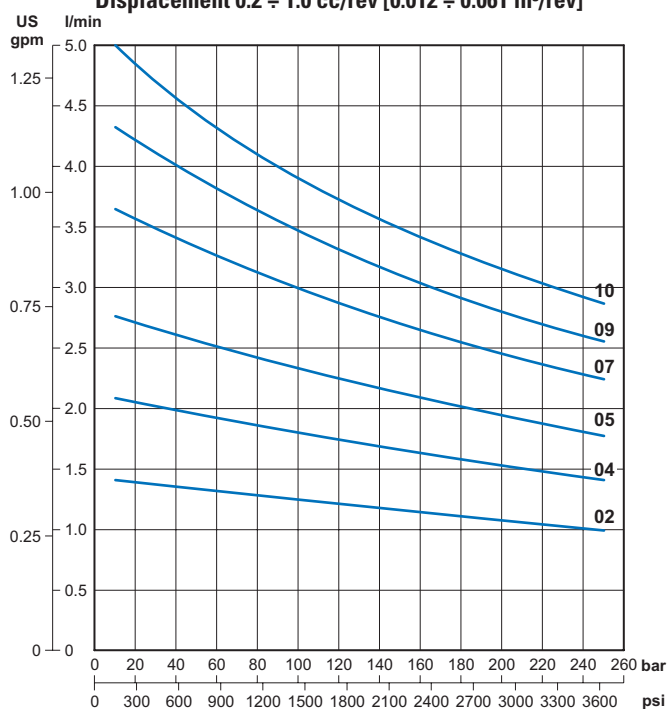
Voltage	24 VDC
Power	2.0 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

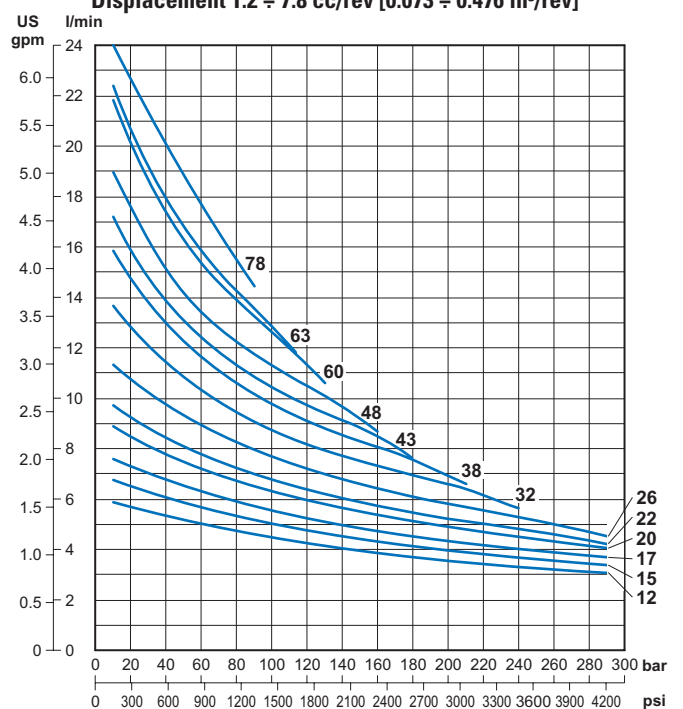
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

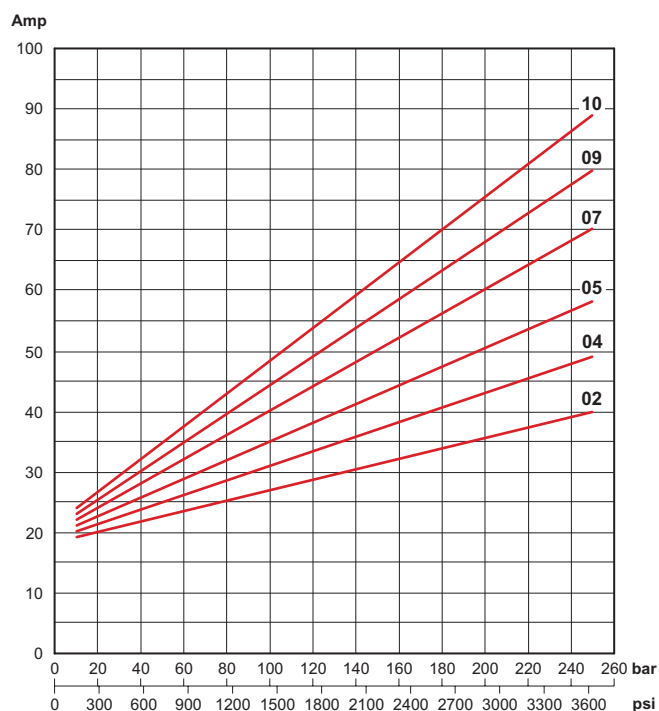
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



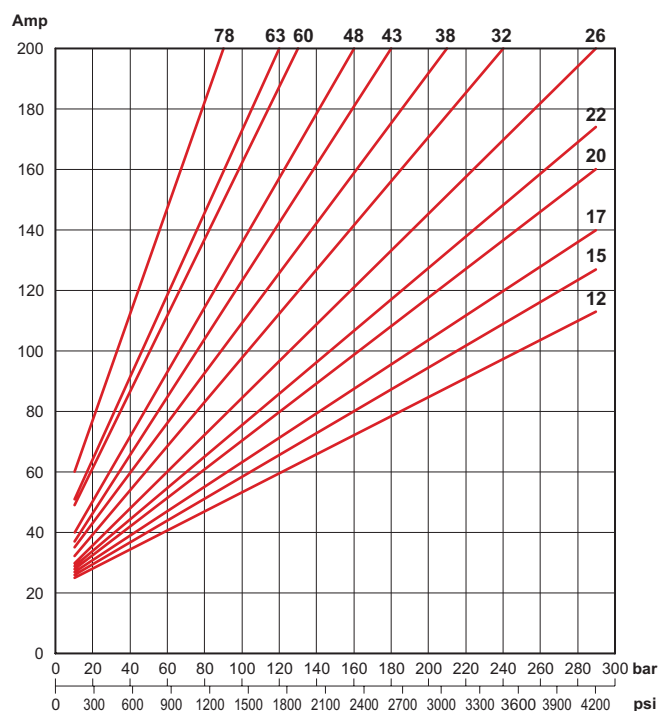
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



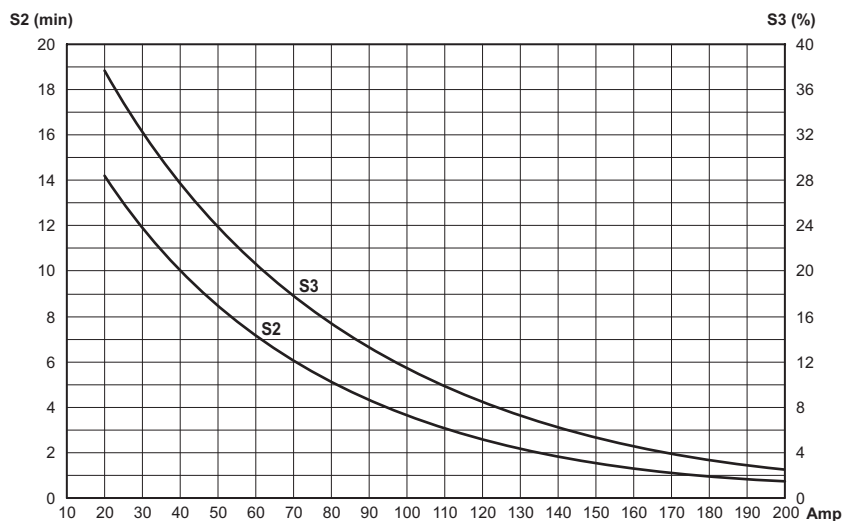
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

Code	Description
25022300	24VDC motor - 2.0 kW

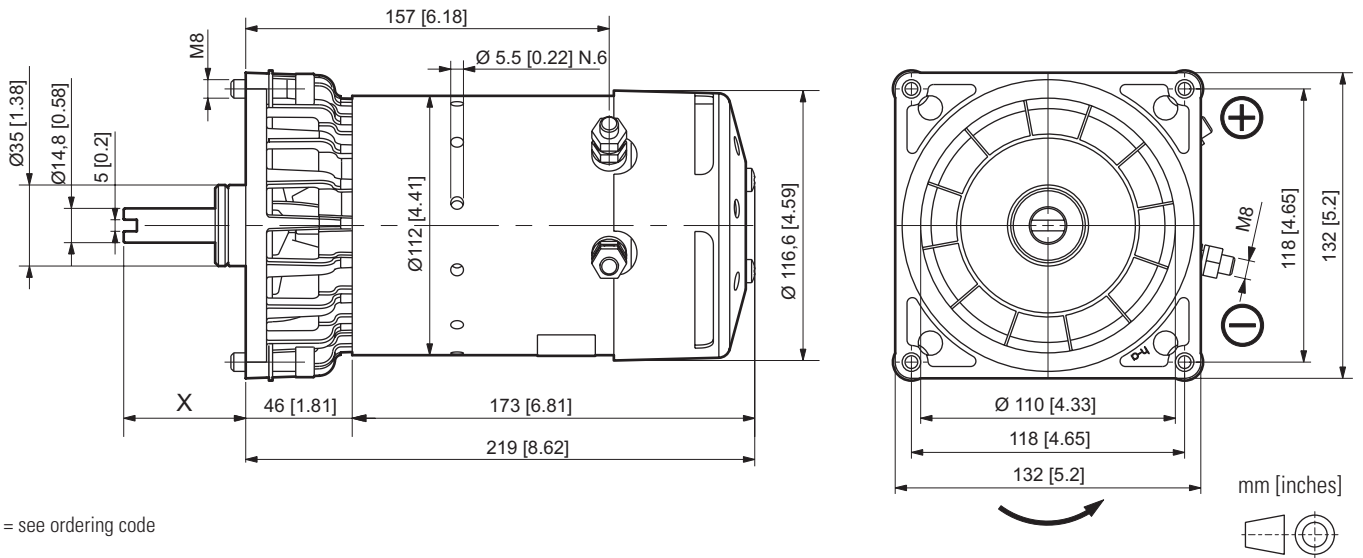
Code	Description
KIT07012.034	Starting switch kit 24VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 200A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

25022300 FAN

24VDC MOTOR - D.115



X = see ordering code

RATED FEATURES

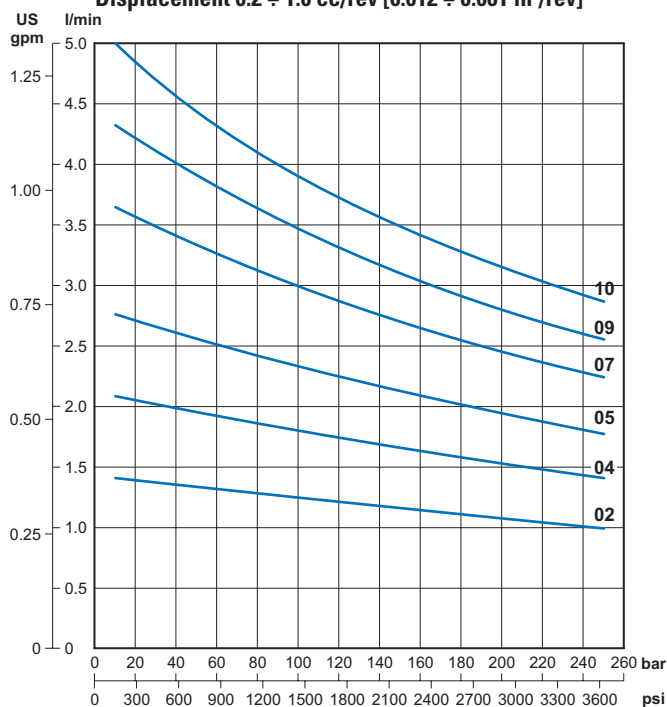
Voltage	24 VDC
Power	2.0 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	7.4 kg [16.31 lb]

PUMP TYPE

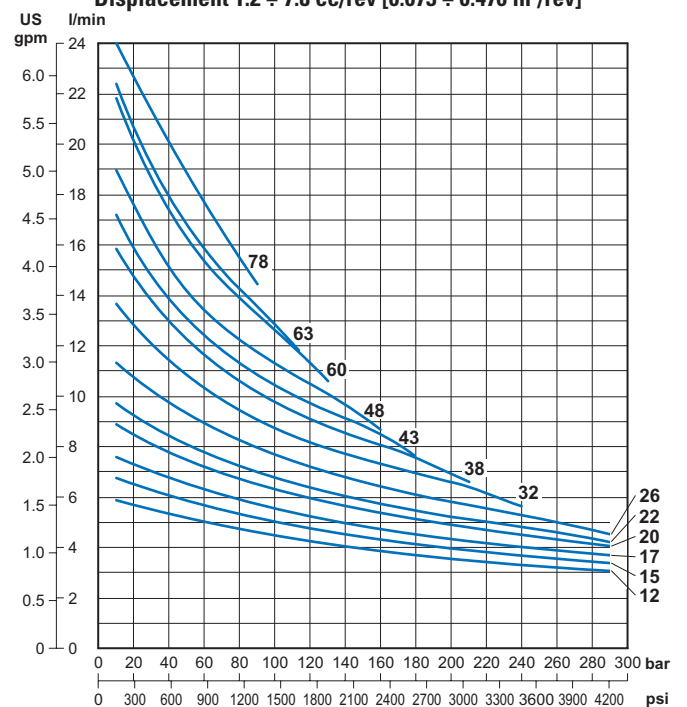
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]

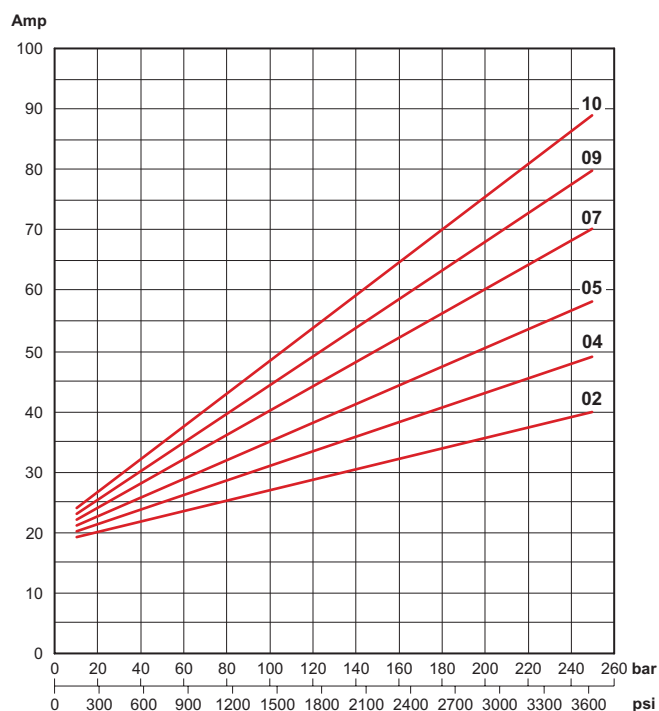


Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]

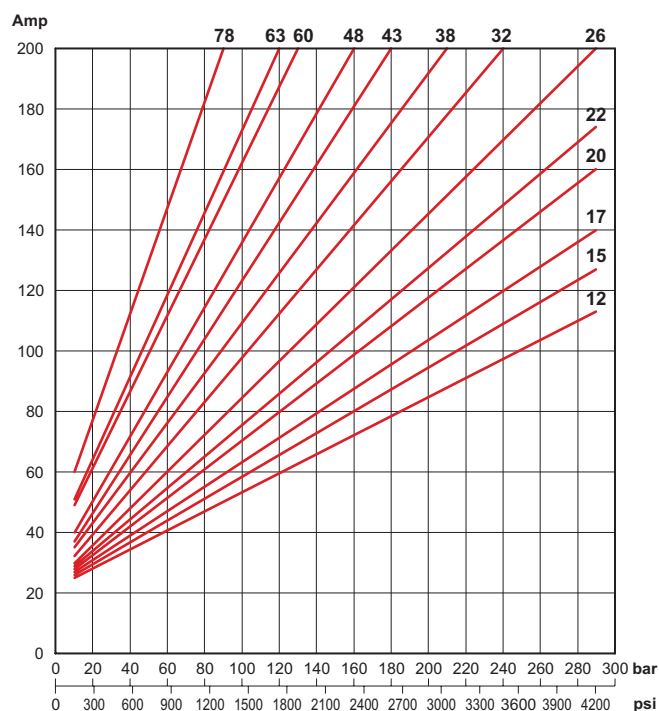


25022300 FAN

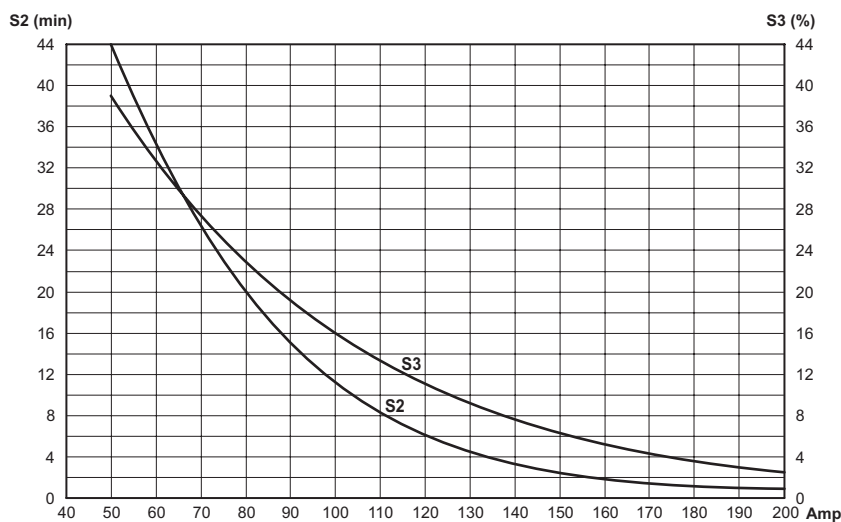
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



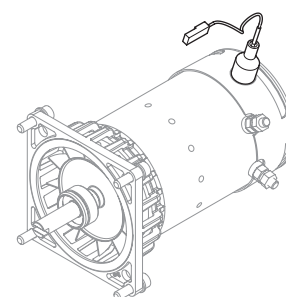
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

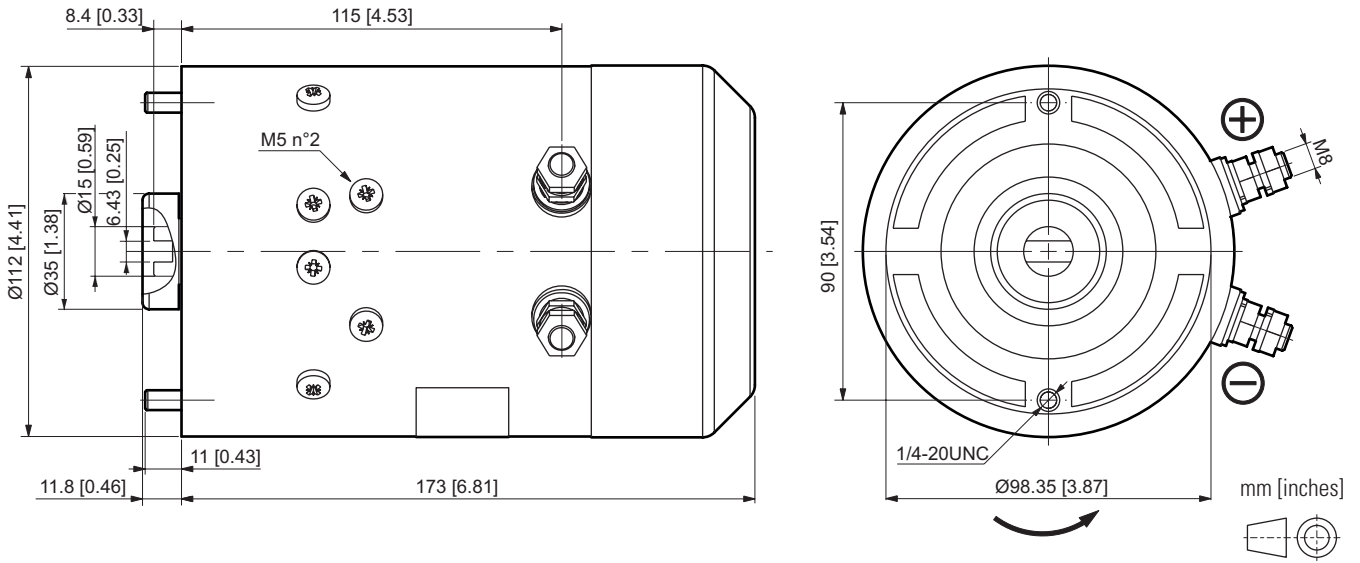
Power pack	X mm [inch]	Code Fan cooled motor	Code Fan cooled motor with thermal switch	Code Fan cooled kit
FP	52.6 [2.07]	KIT09008.031	KIT09008.063	25017800
MC	41.6 [1.64]	KIT01008.067	KIT01008.077	25002300

Code	Description
KIT07012.034	Starting switch kit 24VDC - 120A (fixing with clamp)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 tempera-
ture 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 200A. Stabilized voltage to 24 Vdc detected at the
terminals of the electric motor.

12VDC MOTOR - D.115



RATED FEATURES

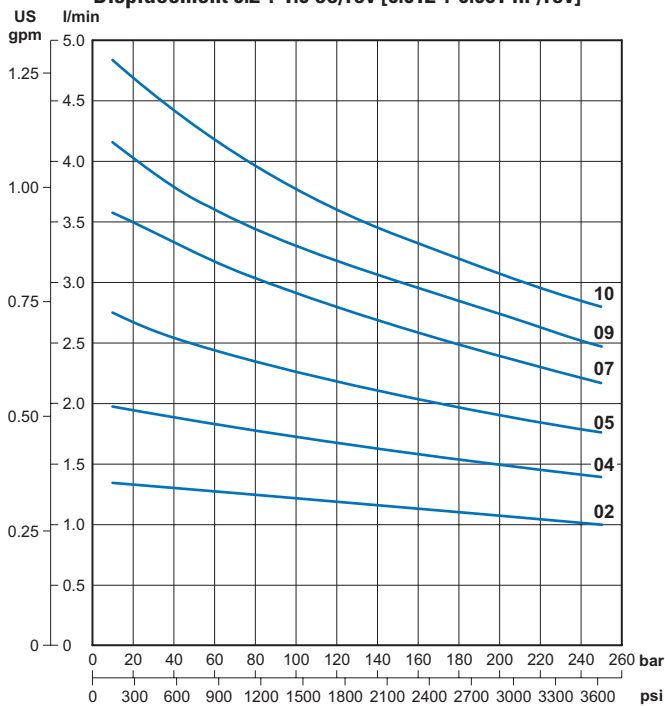
Voltage	12 VDC
Power	1.6 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

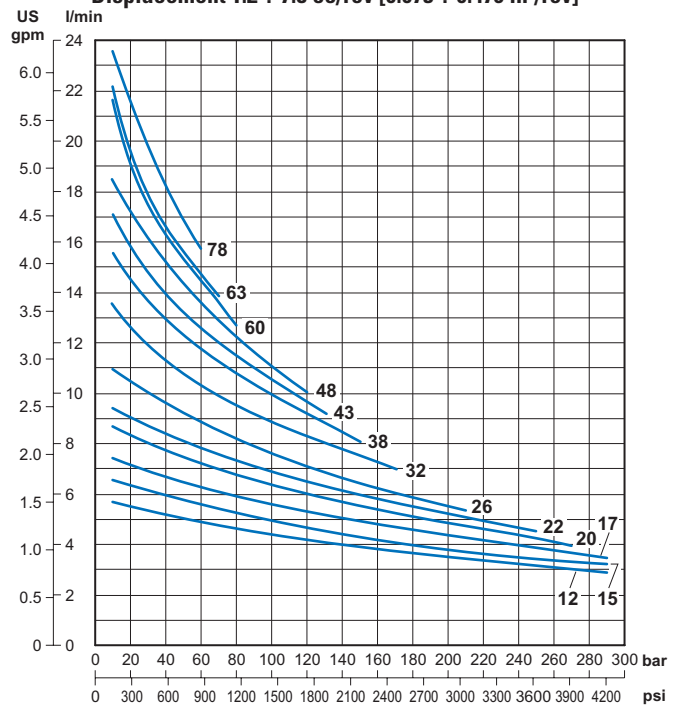
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

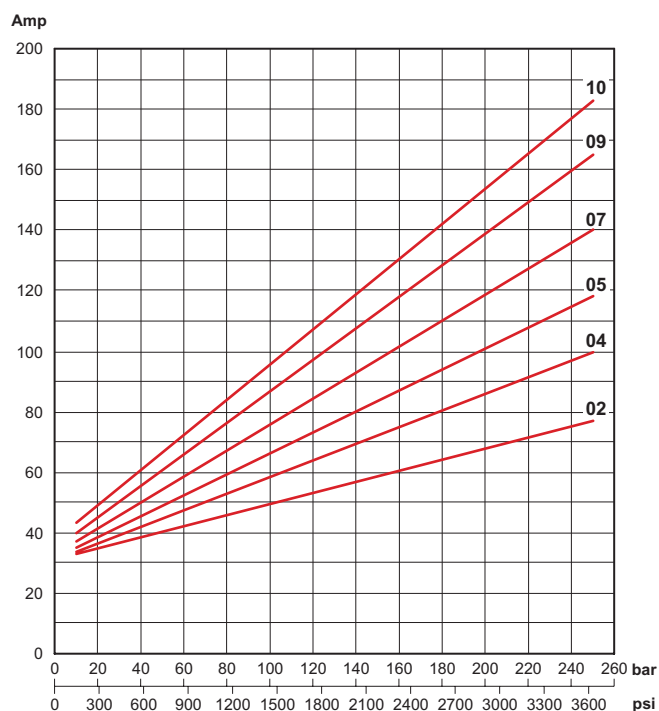
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



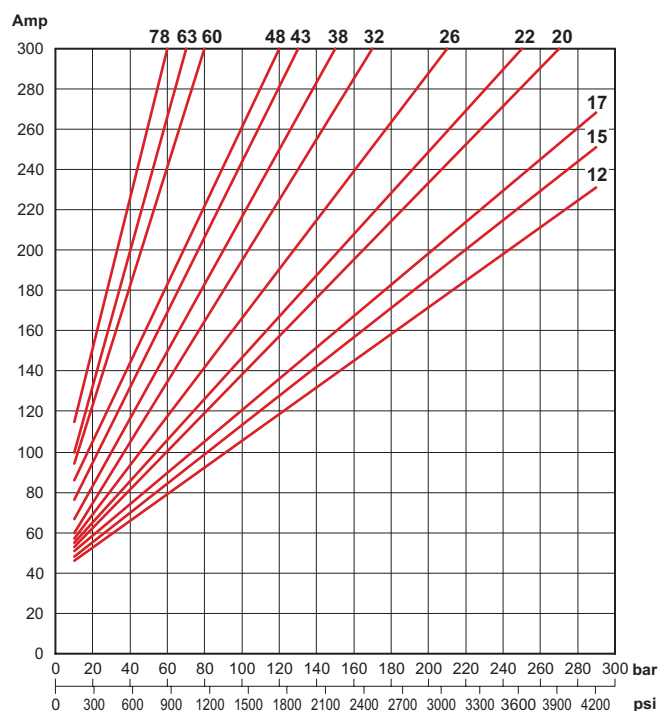
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



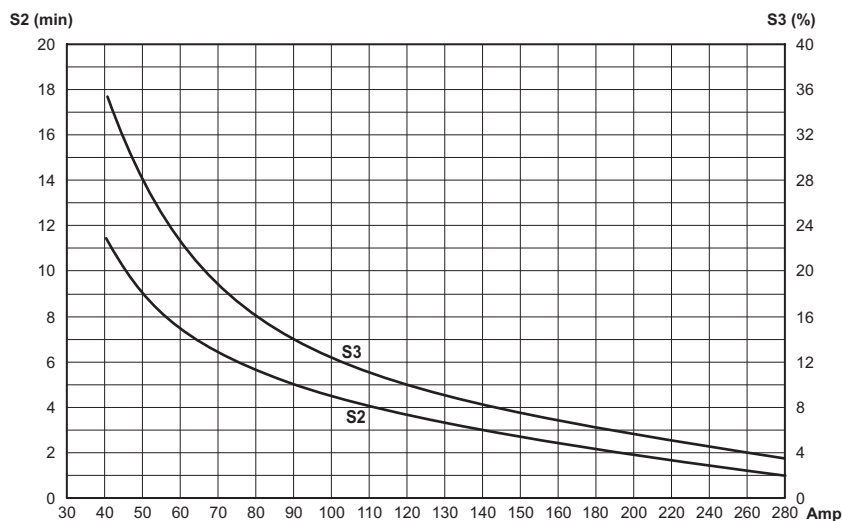
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

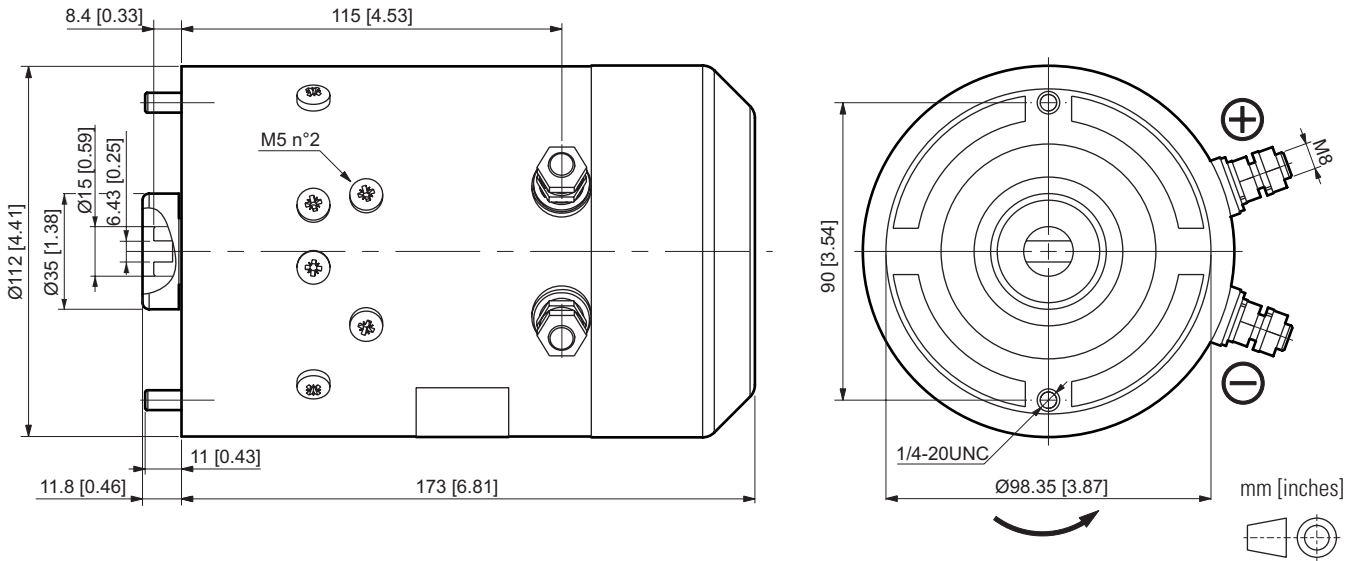
Code	Description
25022000	24VDC motor - 1.6 kW

Code	Description
KIT07012.025	Starting switch kit 12VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.115



RATED FEATURES

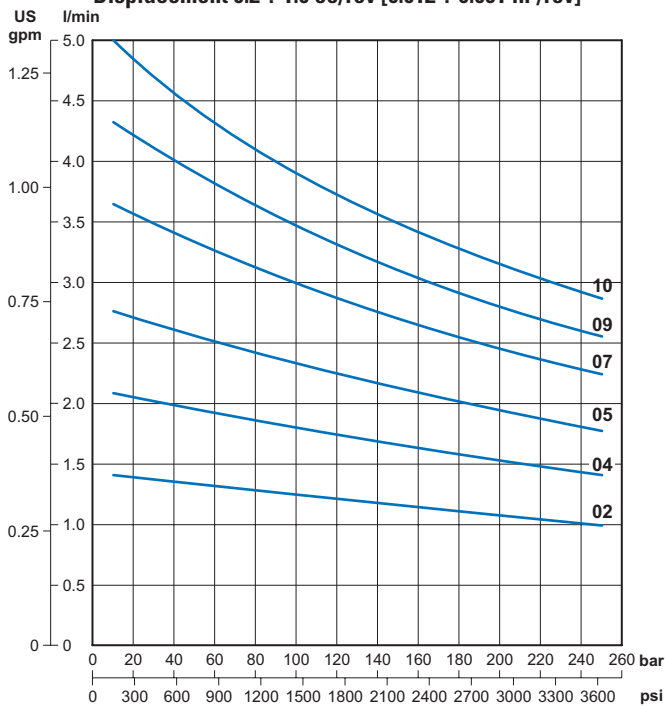
Voltage	24 VDC
Power	2.2 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

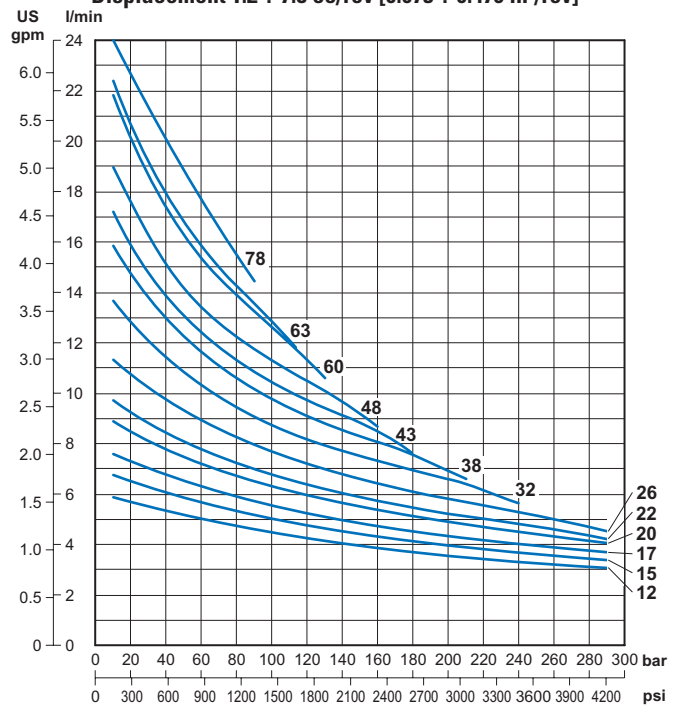
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

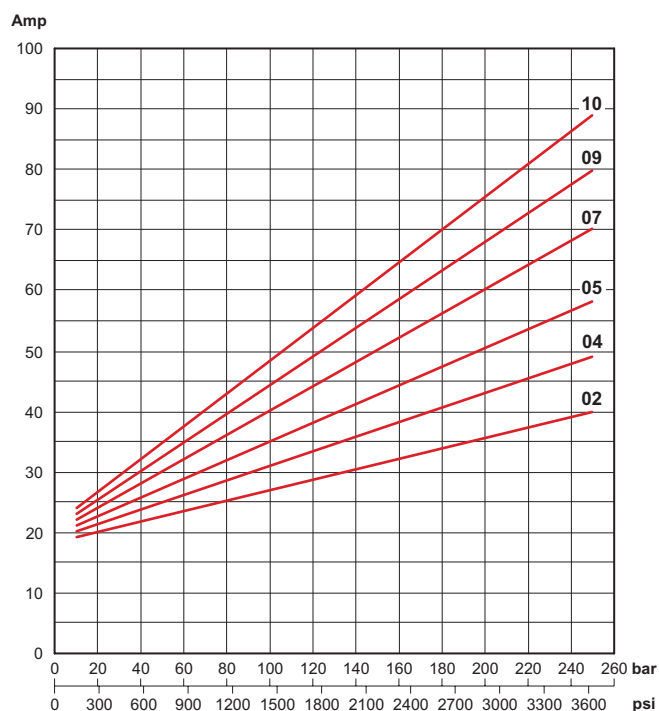
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



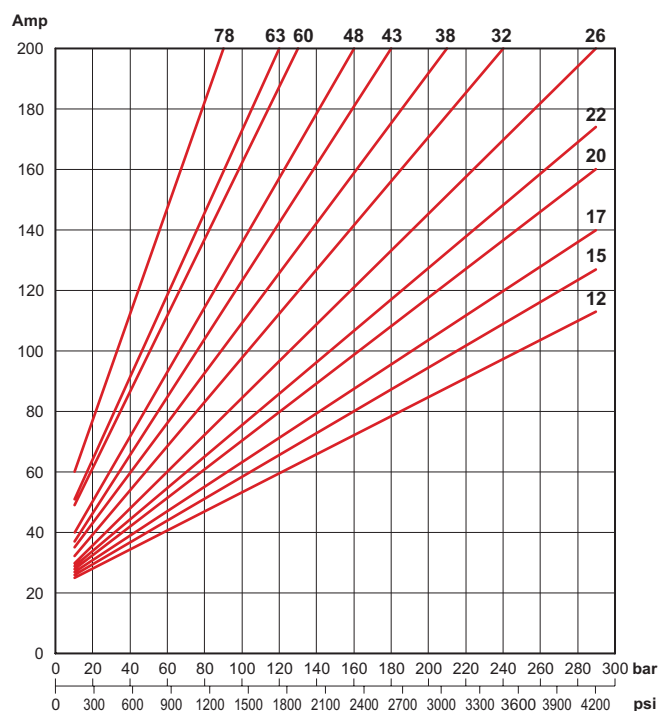
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



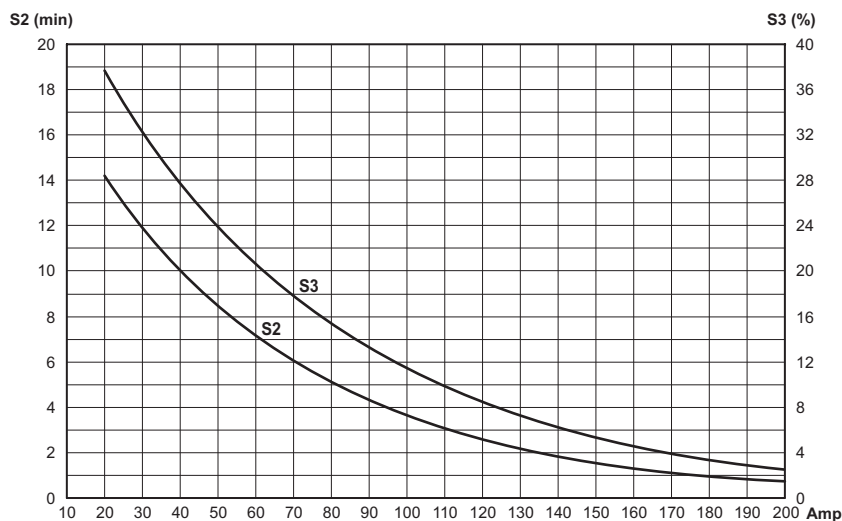
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 7.8 cc/rev [0.073 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

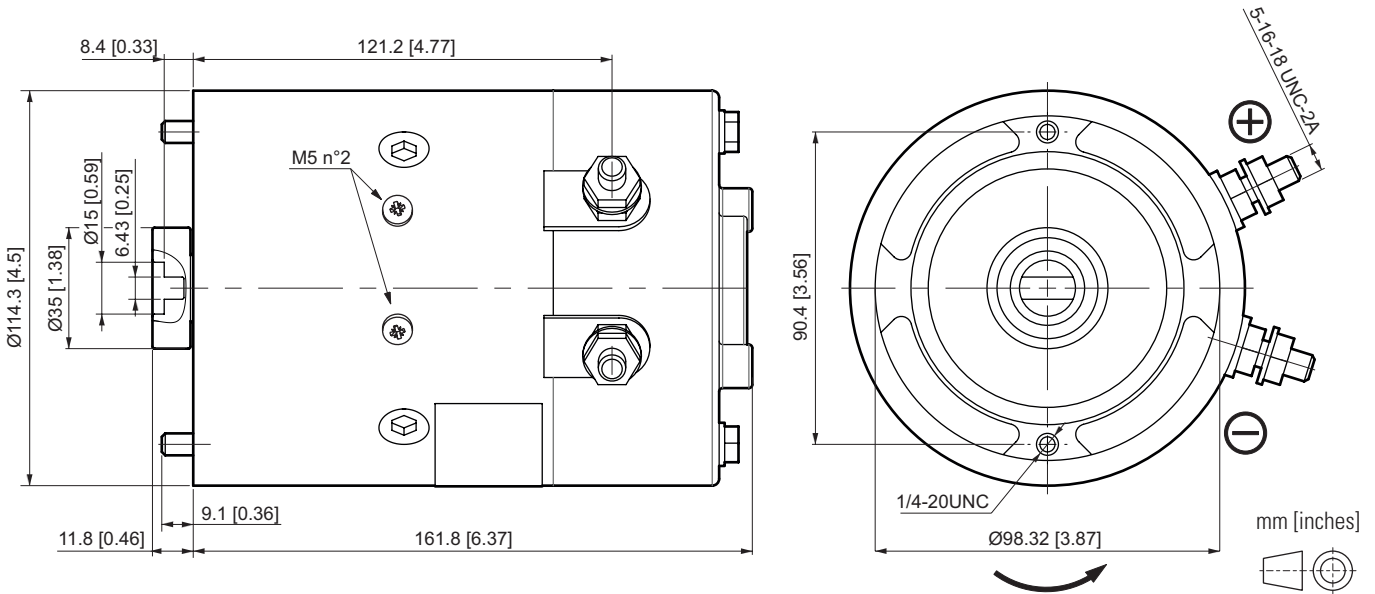
Code	Description
25022100	24VDC motor - 2.2 kW

Code	Description
KIT07012.026	Starting switch kit 24VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 200A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

12VDC MOTOR - D.115



RATED FEATURES

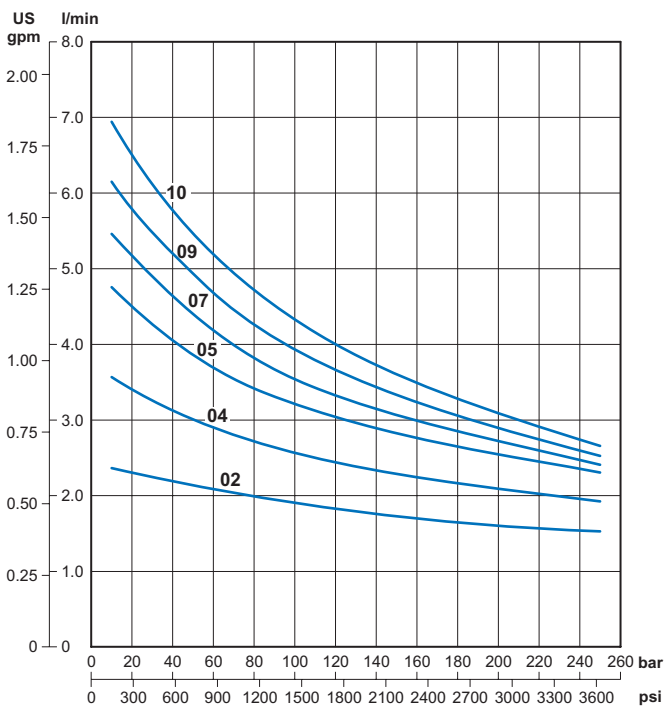
Voltage	12 VDC
Power	1.6 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Serie "U" (USA)
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

PUMP TYPE

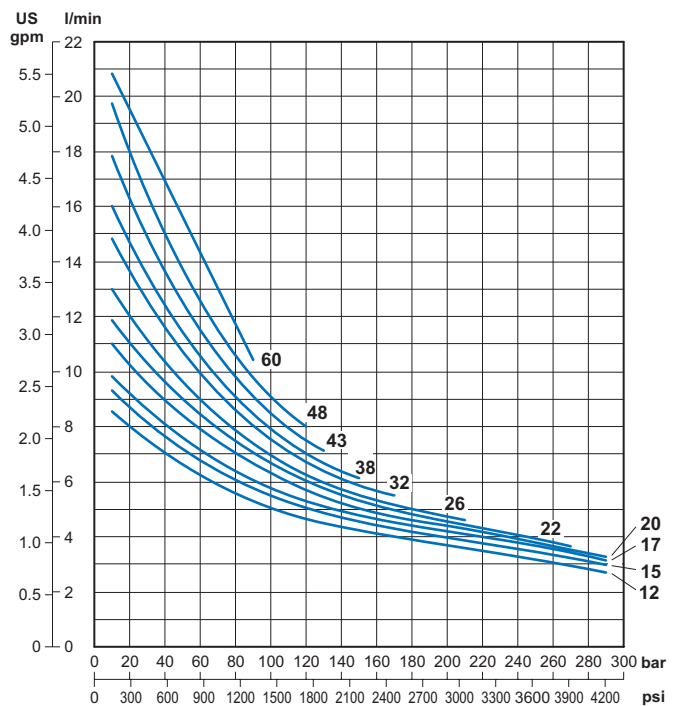
Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

Code	cc/rev.	GR (Size)
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1
43	4.3	1
48	4.8	1
60	6.0	1

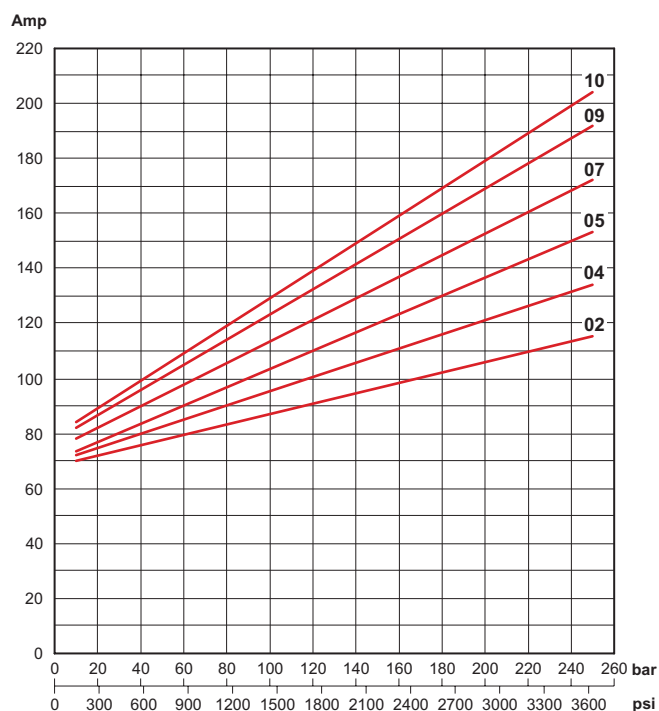
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



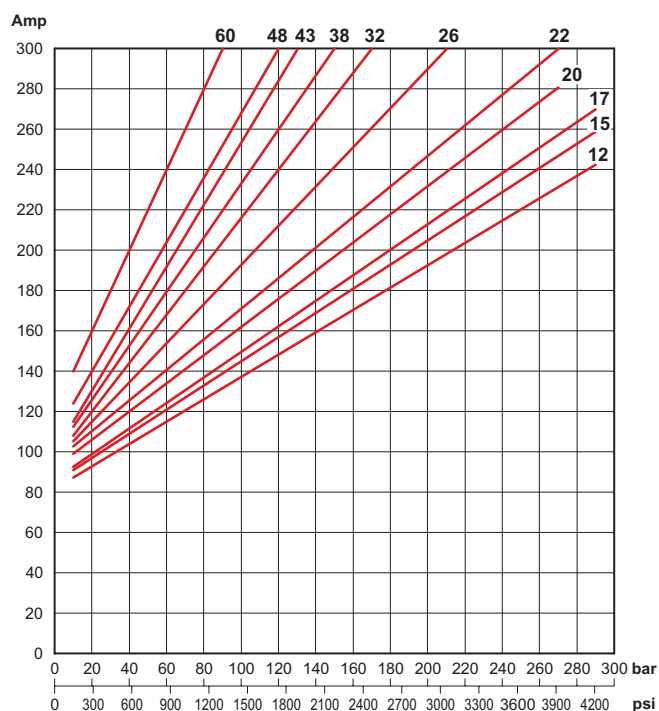
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 6.0 cc/rev [0.073 ÷ 0.366 in³/rev]



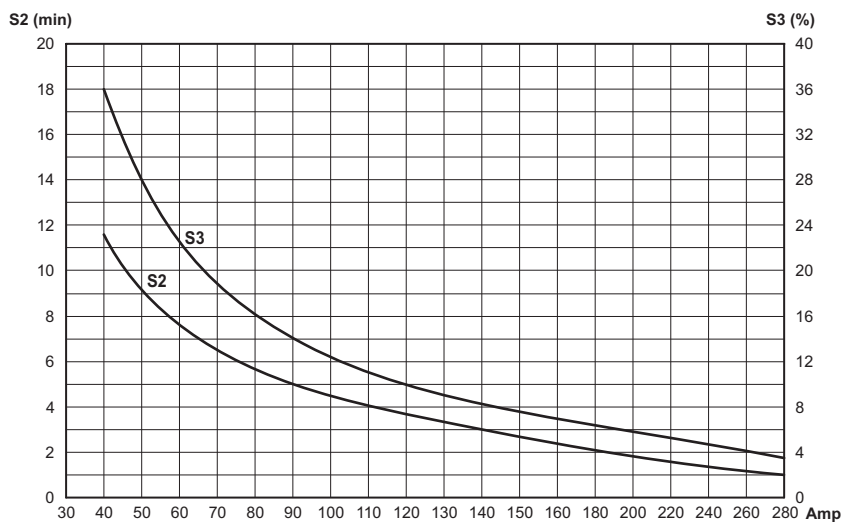
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



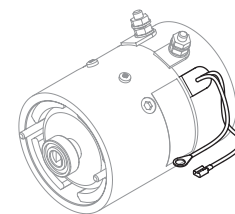
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 6.0 cc/rev [0.073 ÷ 0.366 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

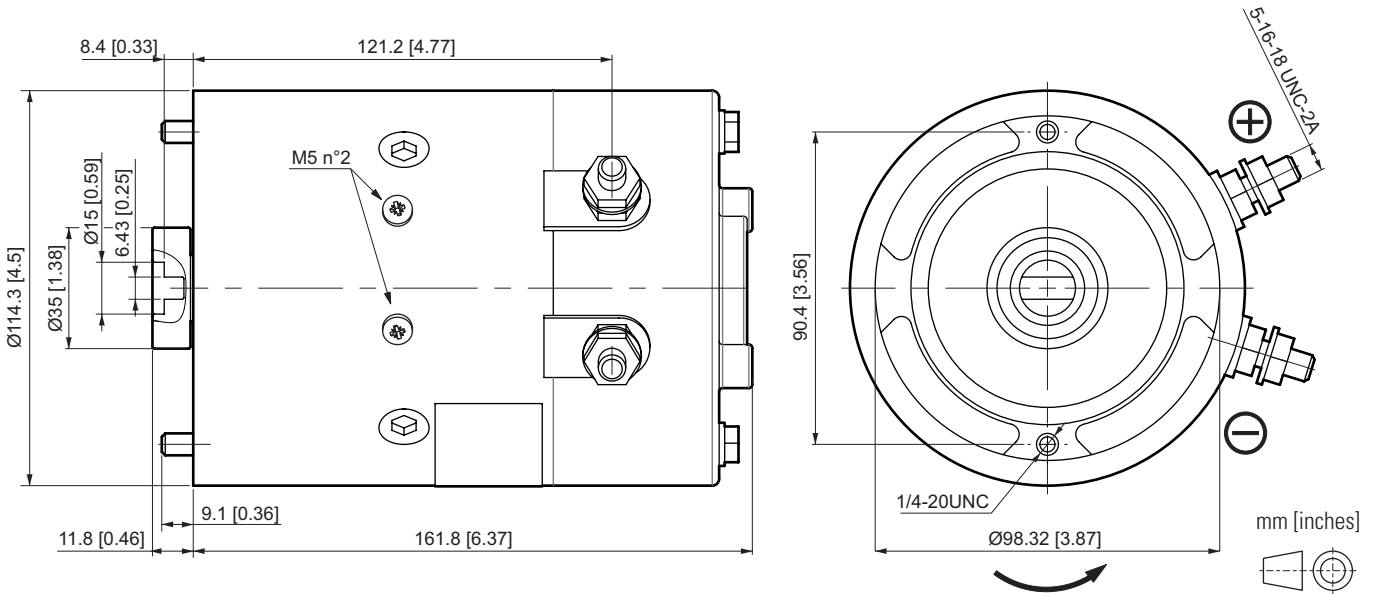
Code	Description
25022600	12VDC motor - 1.6 kW
25022800	12VDC motor - 1.6 kW with thermal switch

Code	Description
KIT07012.025	Starting switch kit 12VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure P_{max} = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current I_{max} = 300A. Stabilized voltage to 12 Vdc detected at the terminals of the electric motor.

24VDC MOTOR - D.115



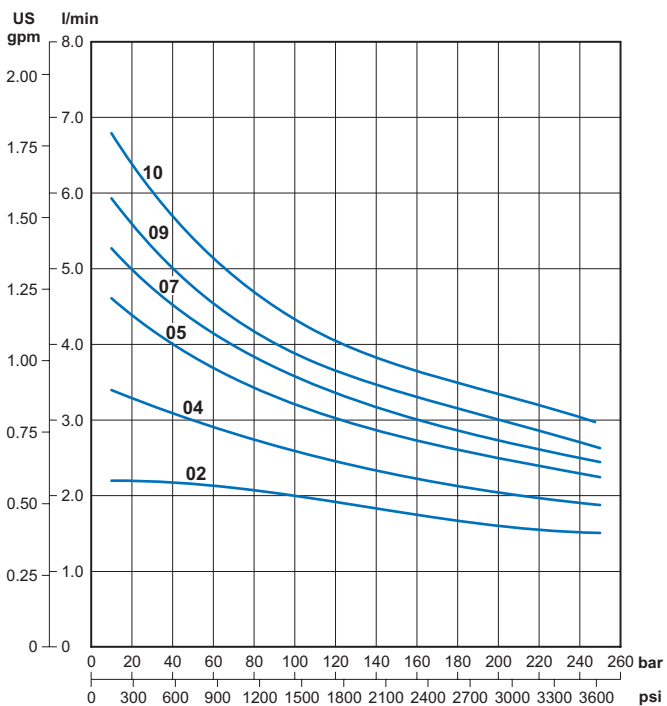
RATED FEATURES

Voltage	24 VDC
Power	2.2 kW
Nominal diameter	115 mm [4.53 in]
Motor type	Serie "U" (USA)
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	54
S2 / S3 duty service	see curves
Insulation class	F
Weight	6.7 kg [14.77 lb]

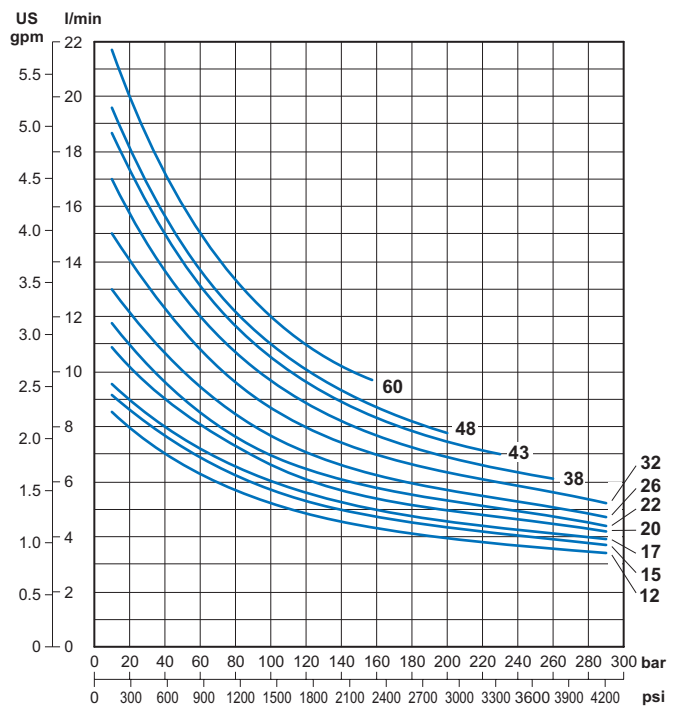
PUMP TYPE

Code	cc/rev.	GR (Size)
02	0.25	05
04	0.45	05
05	0.56	05
07	0.75	05/1
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1

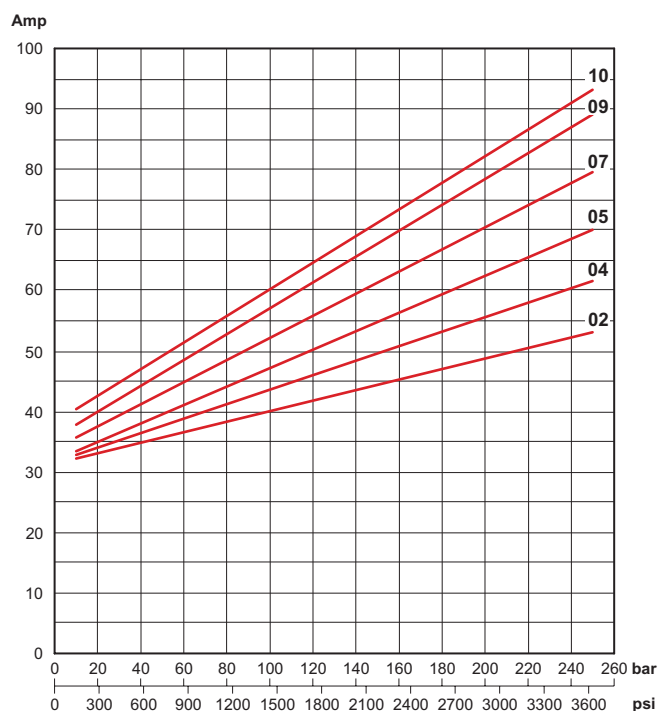
Performance with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



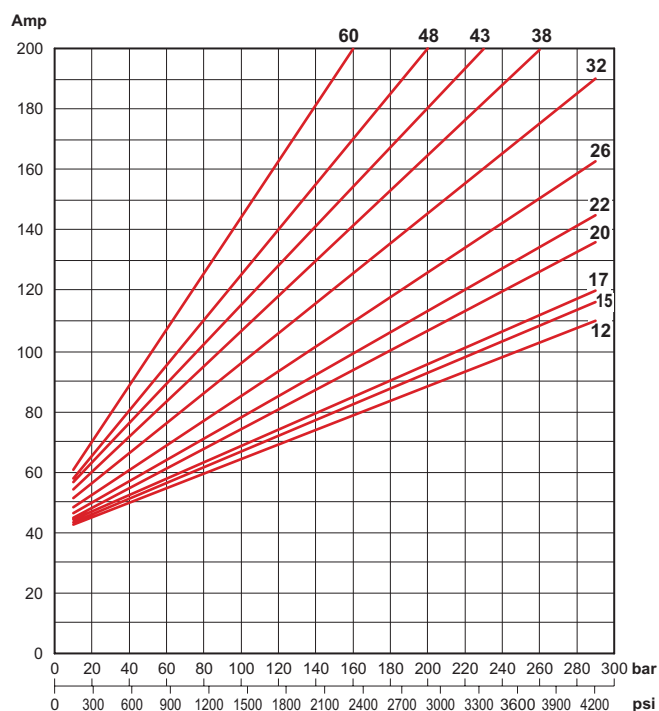
Performance with GR05 / GR1 pumps
Displacement 1.2 ÷ 6.0 cc/rev [0.073 ÷ 0.366 in³/rev]



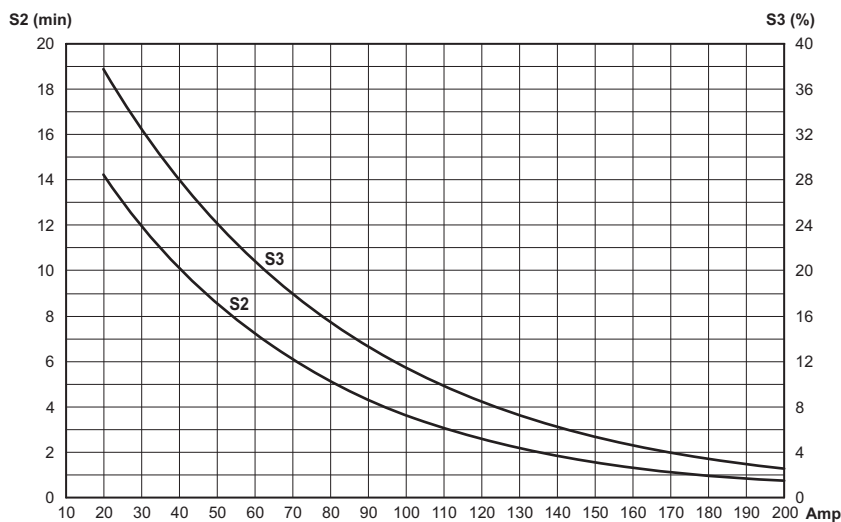
Current with GR05 / GR1 pumps
Displacement 0.2 ÷ 1.0 cc/rev [0.012 ÷ 0.061 in³/rev]



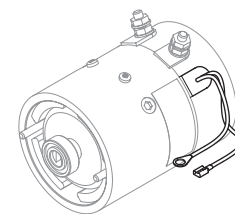
Current with GR05 / GR1 pumps
Displacement 1.2 ÷ 6.0 cc/rev [0.073 ÷ 0.366 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

Code	Description
25022700	24VDC motor - 2.2 kW
25022900	24VDC motor - 2.2 kW with thermal switch

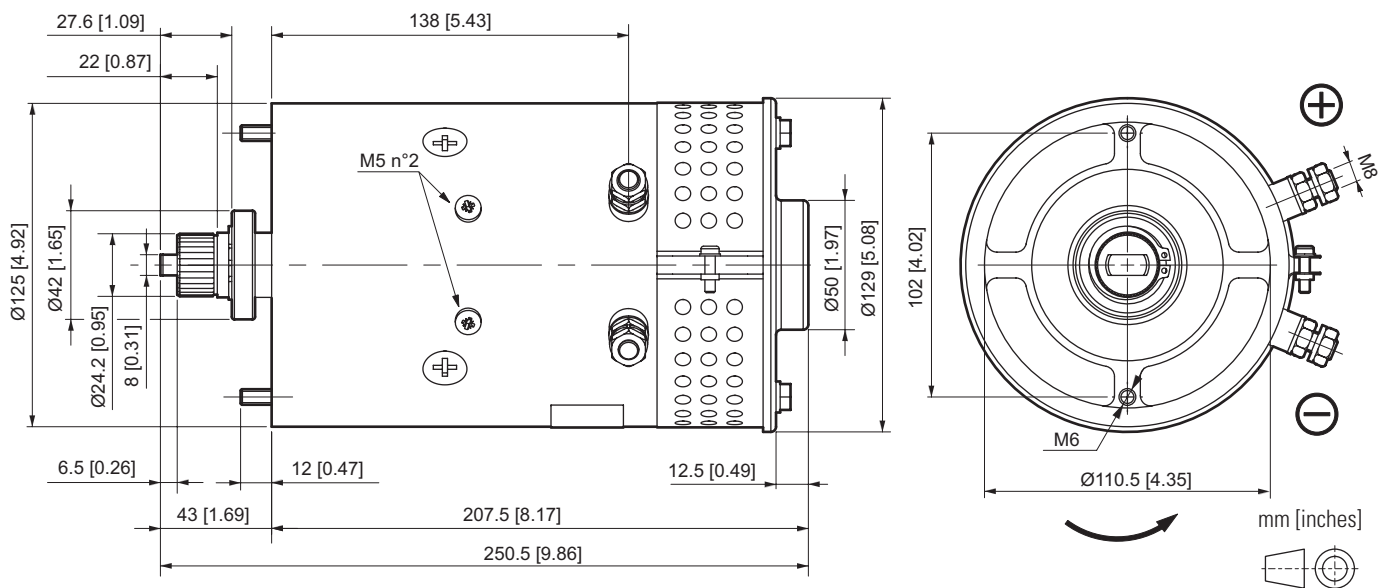
Code	Description
KIT07012.026	Starting switch kit 24VDC - 120A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 200A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

25021300

24VDC MOTOR - D.125



RATED FEATURES

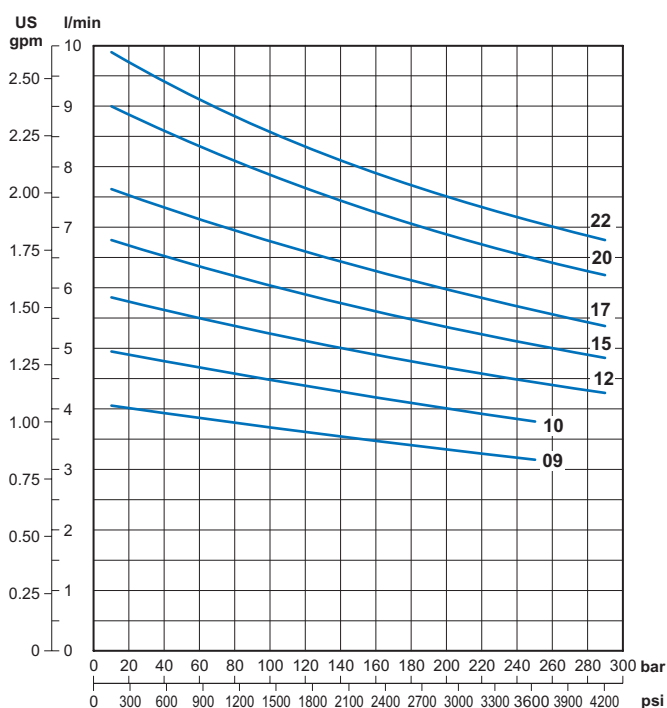
Voltage	24 VDC
Power	3.0 kW
Nominal diameter	125 mm [4.92 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	20
S2 / S3 duty service	see curves
Insulation class	F
Weight	12 kg [26.46 lb]

PUMP TYPE

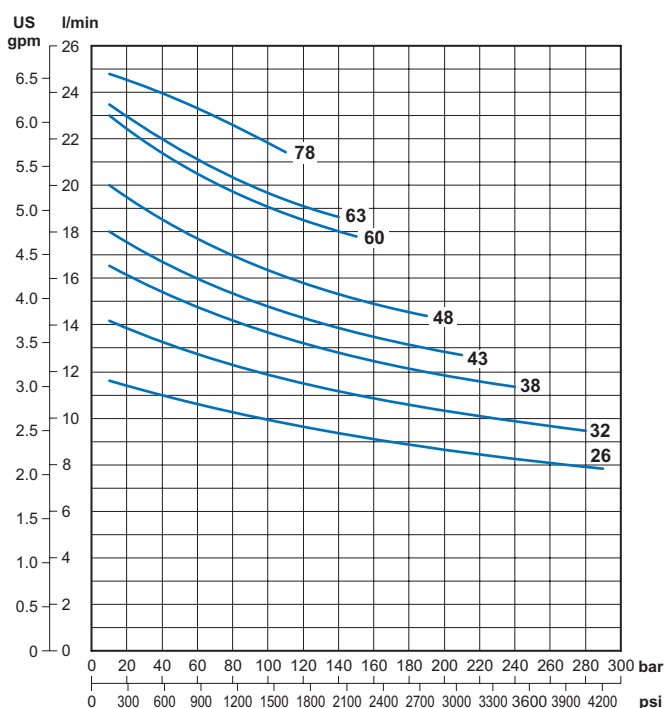
Code	cc/rev.	GR (Size)
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1

Code	cc/rev.	GR (Size)
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

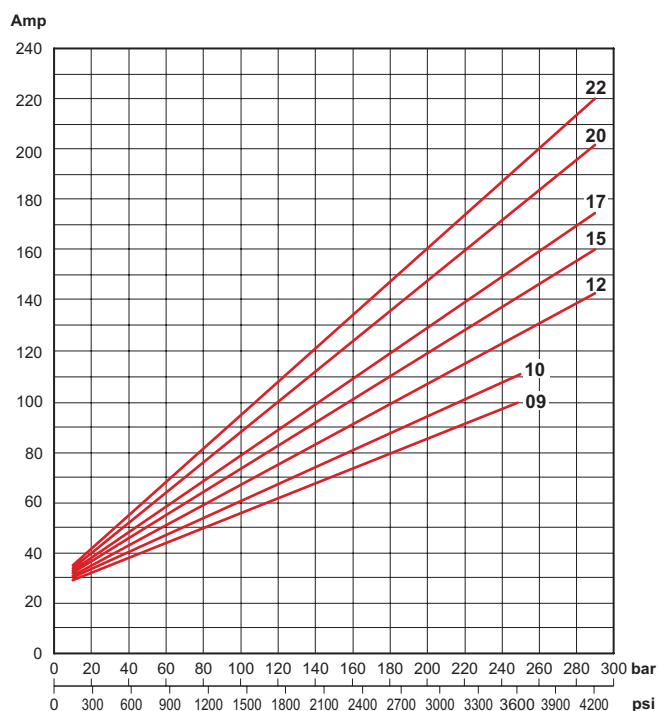
Performance with GR05 / GR1 pumps
Displacement $0.9 \div 2.2 \text{ cc/rev}$ [$0.055 \div 0.134 \text{ in}^3/\text{rev}$]



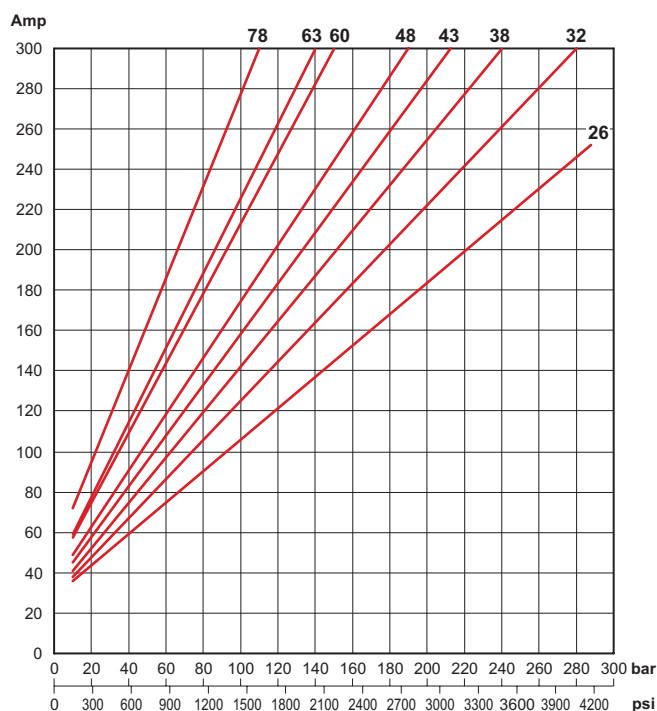
Performance with GR1 pumps
Displacement $2.6 \div 7.8 \text{ cc/rev}$ [$0.159 \div 0.476 \text{ in}^3/\text{rev}$]



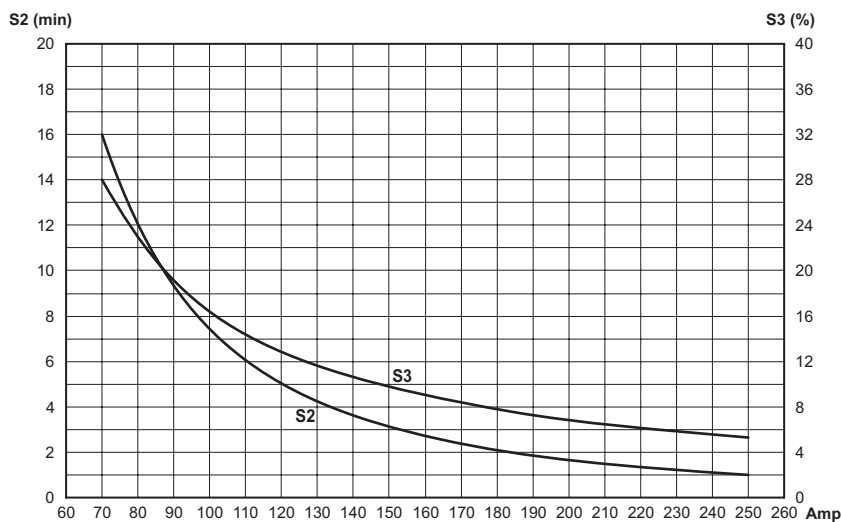
Current with GR05 / GR1 pumps
Displacement 0.9 ÷ 2.2 cc/rev [0.055 ÷ 0.134 in³/rev]



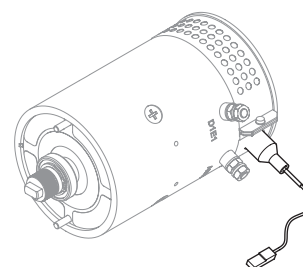
Current with GR1 pumps
Displacement 2.6 ÷ 7.8 cc/rev [0.159 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

Code	Description
25021300	24VDC motor - 3.0 kW
25023000	24VDC motor - 3.0 kW with thermal switch

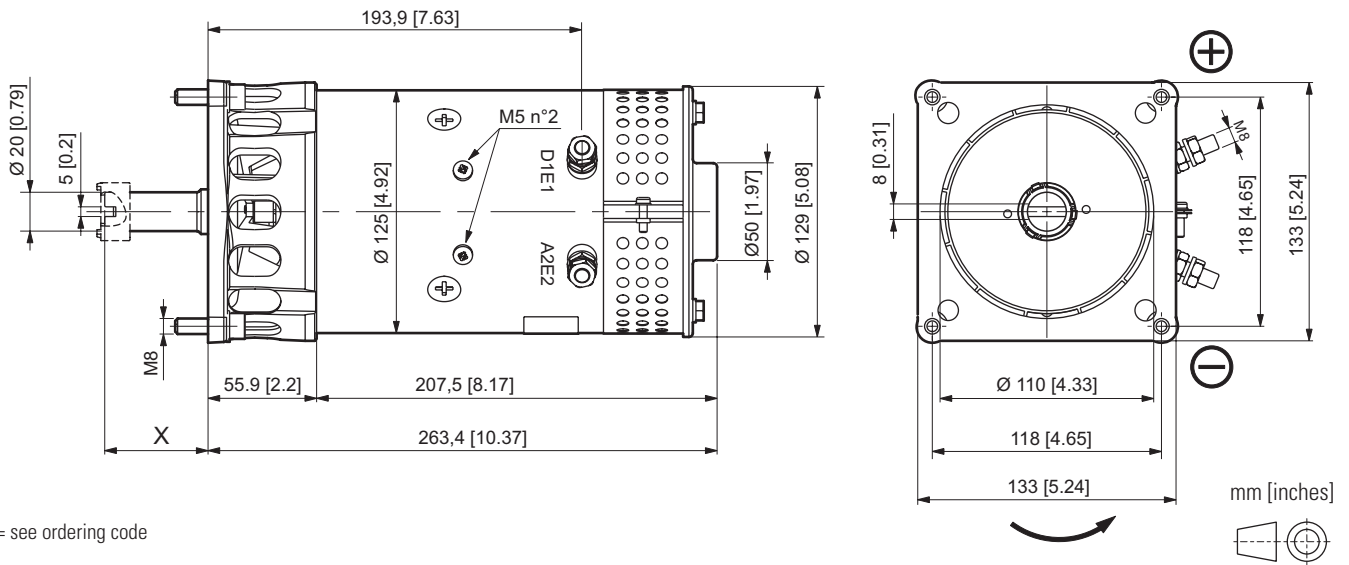
Code	Description
KIT07012.019	Starting switch kit 24VDC - 150A (fixing with screws)

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

25021300 FAN

24VDC MOTOR - D.125



X = see ordering code

RATED FEATURES

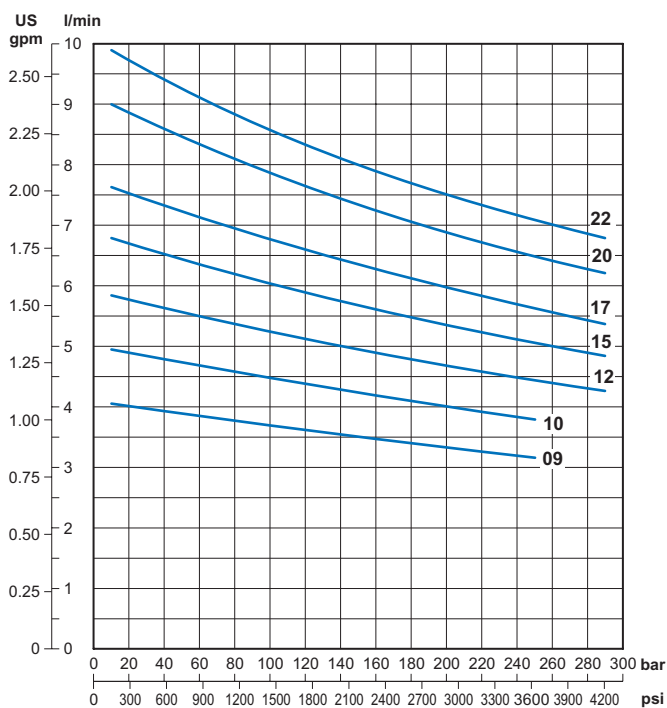
Voltage	24 VDC
Power	3.0 kW
Nominal diameter	125 mm [4.92 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	20
S2 / S3 duty service	see curves
Insulation class	F
Weight	13.1 kg [28.88 lb]

PUMP TYPE

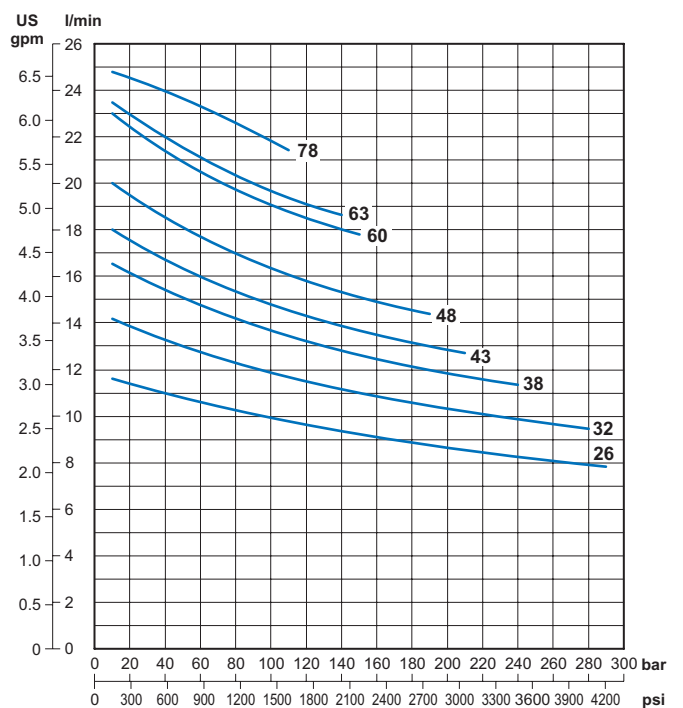
Code	cc/rev.	GR (Size)
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1

Code	cc/rev.	GR (Size)
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

Performance with GR05 / GR1 pumps
Displacement 0.9 ÷ 2.2 cc/rev [0.055 ÷ 0.134 in³/rev]

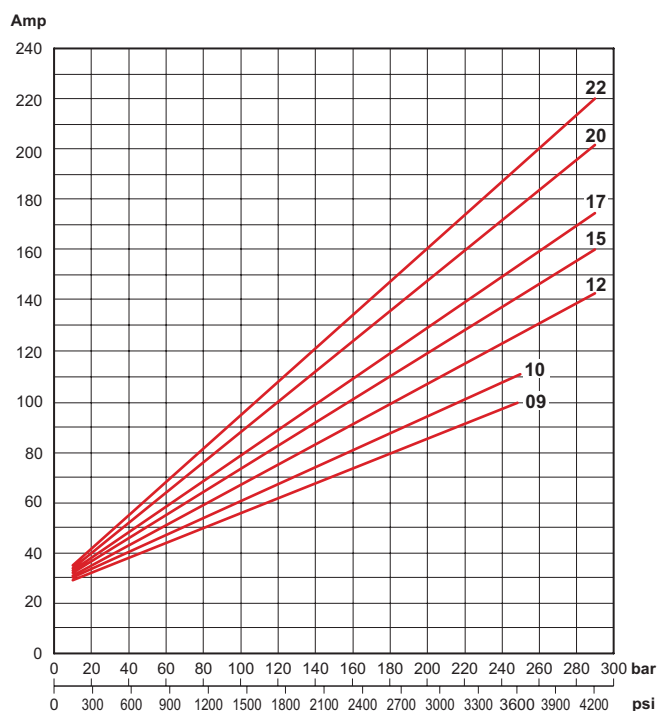


Performance with GR1 pumps
Displacement 2.6 ÷ 7.8 cc/rev [0.159 ÷ 0.476 in³/rev]

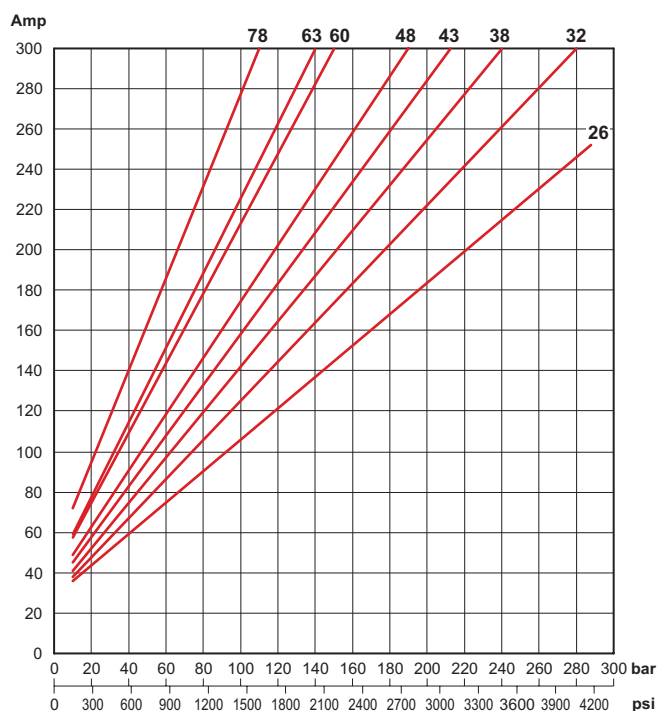


25021300 FAN

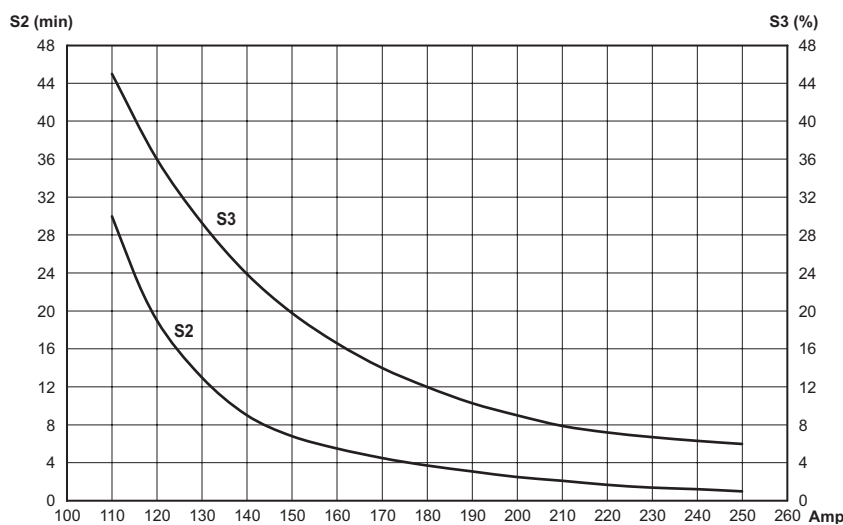
Current with GR05 / GR1 pumps
Displacement 0.9 ÷ 2.2 cc/rev [0.055 ÷ 0.134 in³/rev]



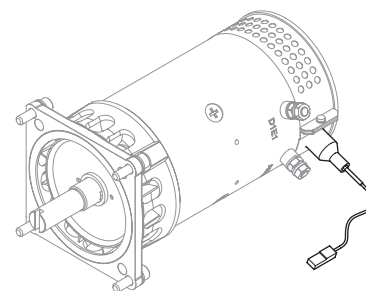
Current with GR1 pumps
Displacement 2.6 ÷ 7.8 cc/rev [0.159 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



Motor with thermal switch



ORDERING CODE

Power pack	X mm [inch]	Code Fan cooled motor	Code Fan cooled motor with thermal swich	Code Fan cooled kit
FP	53.2 [2.09]	KIT09008.029	*	25017700
MC	43.4 [1.71]	KIT01008.118	KIT01008.119	25006100

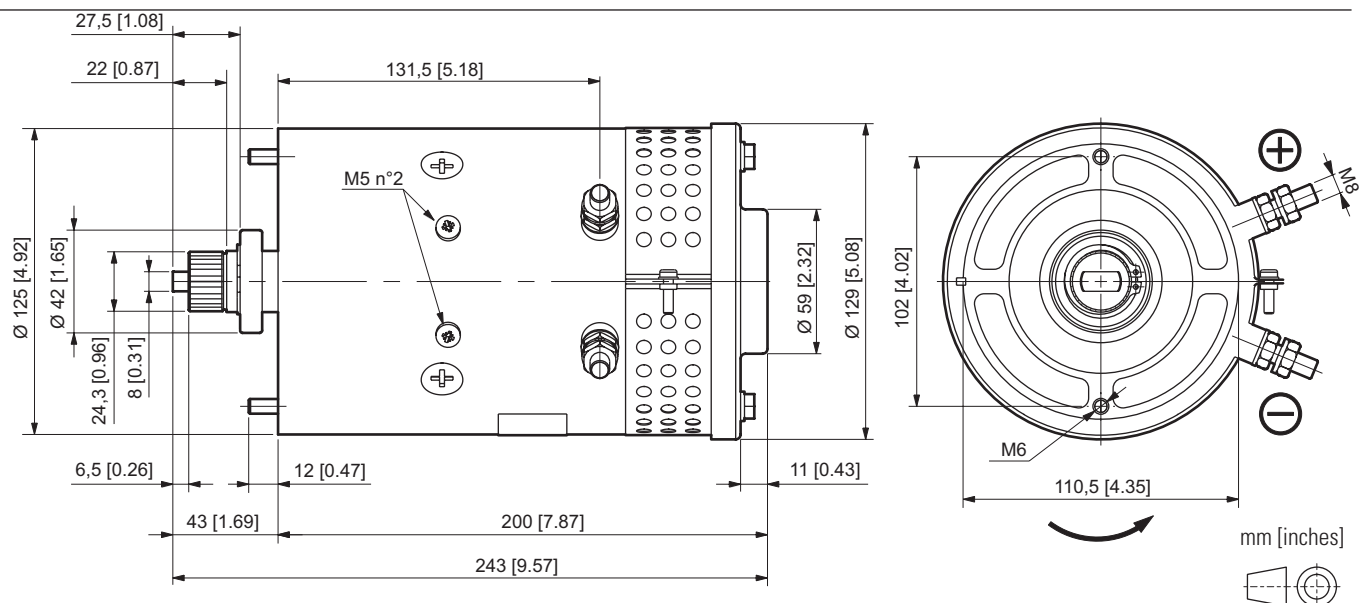
Code	Description
KIT07012.019	Starting switch kit 24VDC - 150A (fixing with clamp)

* please contact our sales department

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 tempera-
ture 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 24 Vdc detected at the
terminals of the electric motor.

24VDC MOTOR - D.125



RATED FEATURES

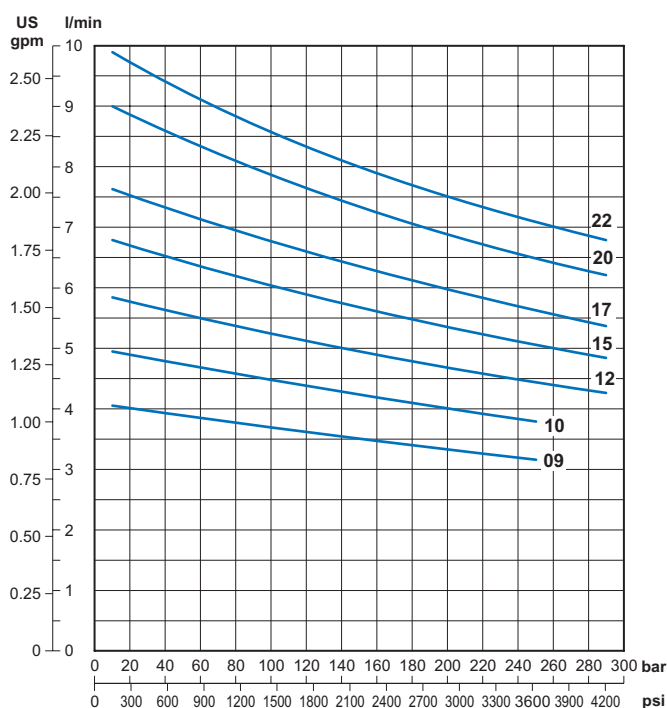
Voltage	24 VDC
Power	3.0 kW
Nominal diameter	125 mm [4.92 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	20
S2 / S3 duty service	see curves
Insulation class	F
Weight	10,5 kg [23.15 lb]

PUMP TYPE

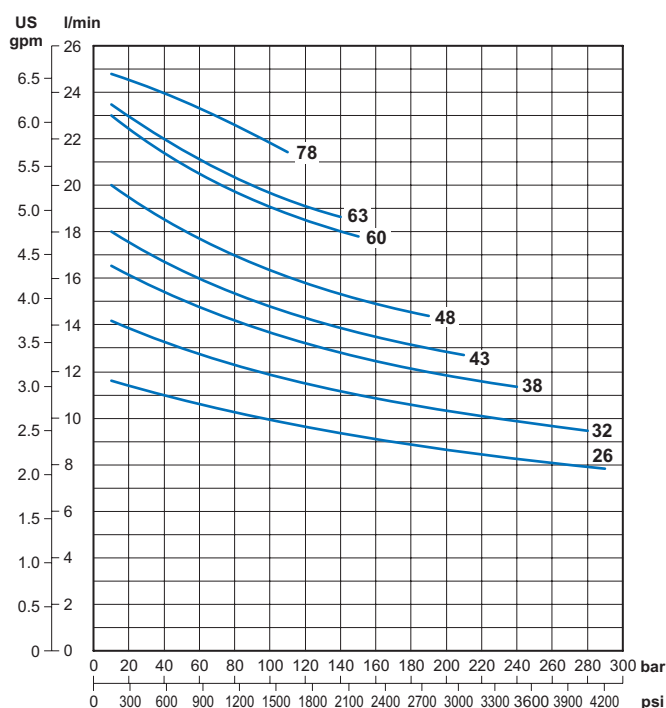
Code	cc/rev.	GR (Size)
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1

Code	cc/rev.	GR (Size)
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

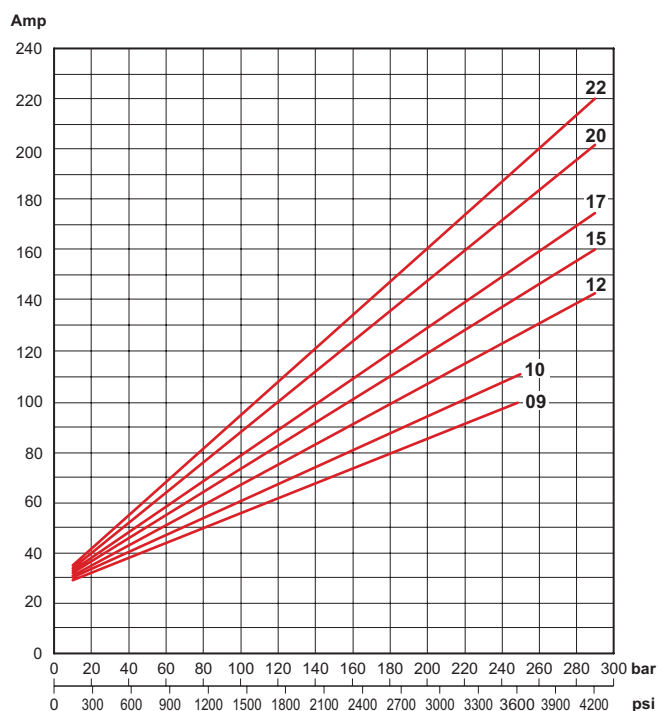
Performance with GR05 / GR1 pumps
Displacement $0.9 \div 2.2$ cc/rev [$0.055 \div 0.134$ in³/rev]



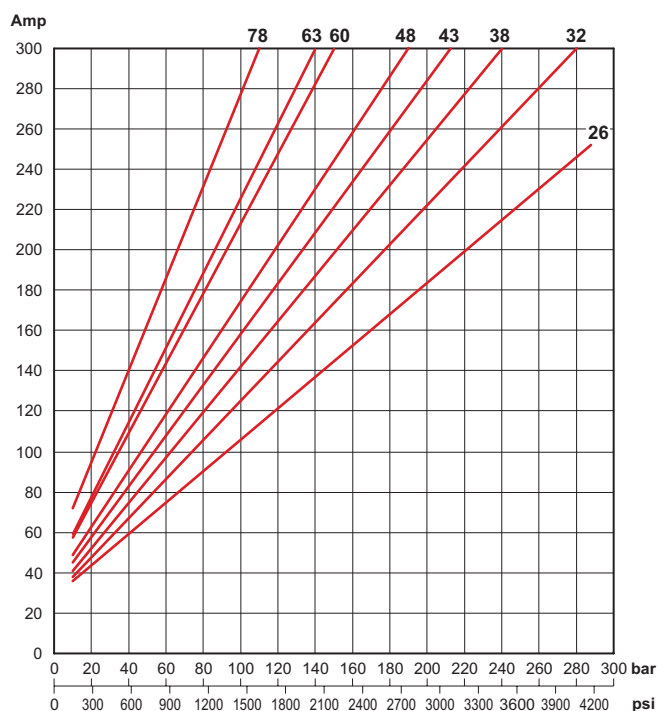
Performance with GR1 pumps
Displacement $2.6 \div 7.8$ cc/rev [$0.159 \div 0.476$ in³/rev]



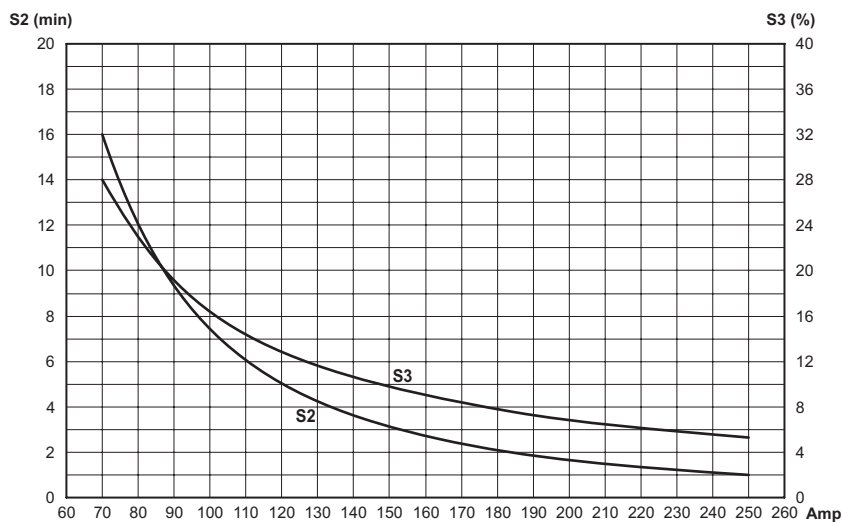
Current with GR05 / GR1 pumps
Displacement $0.9 \div 2.2 \text{ cc/rev}$ [$0.055 \div 0.134 \text{ in}^3/\text{rev}$]



Current with GR1 pumps
Displacement $2.6 \div 7.8 \text{ cc/rev}$ [$0.159 \div 0.476 \text{ in}^3/\text{rev}$]



Thermal characteristics S2 - S3



ORDERING CODE

Code	Description
25022400	24VDC motor - 3.0 kW

Code	Description
KIT07012.019	Starting switch kit 24VDC - 150A (fixing with screws)

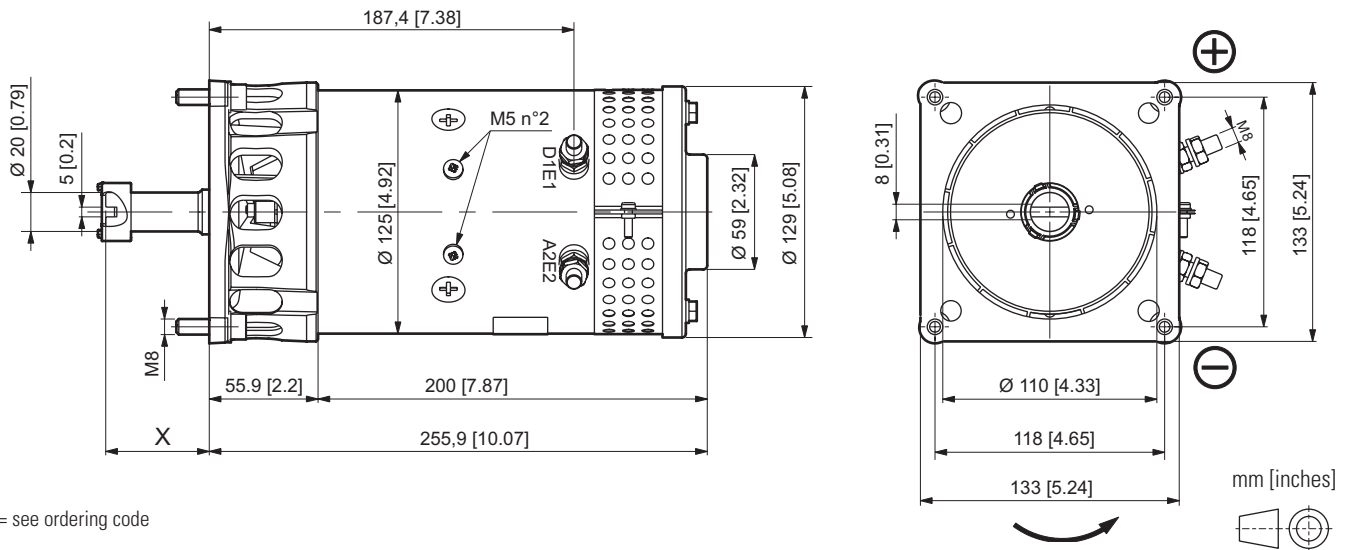
Reference data: maximum nominal pressure $P_{max} = 290 \text{ bar}$. Oil ISO VG32 temperature 35°C (viscosity 40 cSt), outside temperature 25°C .

Maximum nominal current $I_{max} = 300\text{A}$. Stabilized voltage to 24 Vdc detected at the terminals of the electric motor.

25022400 FAN



24VDC MOTOR - D.125



X = see ordering code

RATED FEATURES

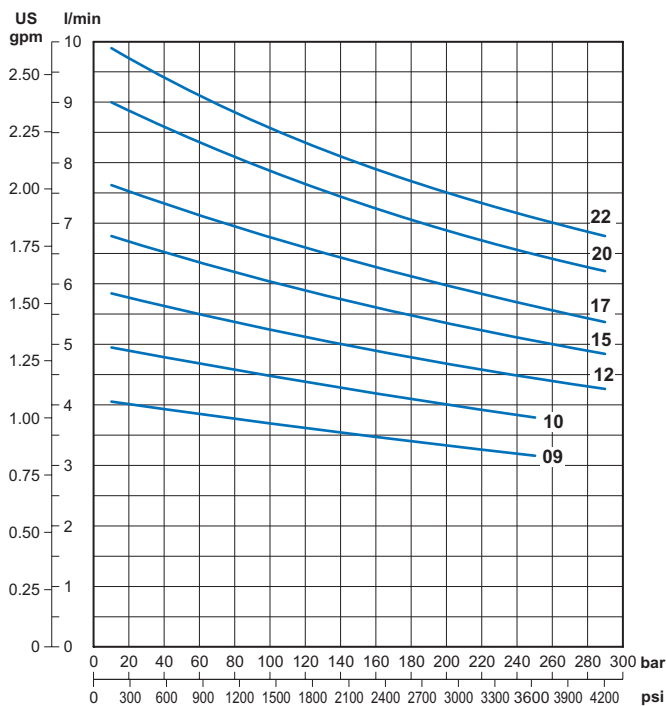
Voltage	24 VDC
Power	3.0 kW
Nominal diameter	125 mm [4.92 in]
Motor type	Wound field compound
Rotation	CCW
Protection class IP (with motor assembled on hydraulic power pack)	20
S2 / S3 duty service	see curves
Insulation class	F
Weight	11.6 kg [25.57 lb]

PUMP TYPE

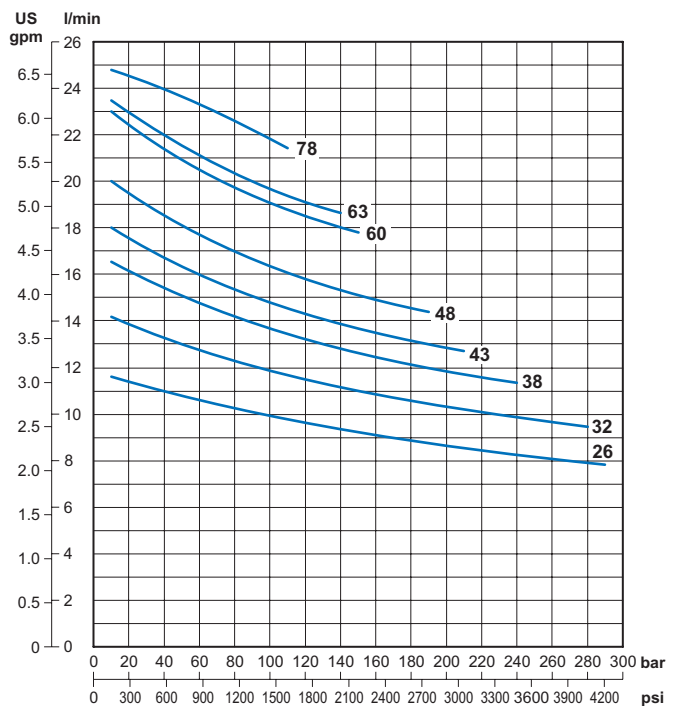
Code	cc/rev.	GR (Size)
09	0.9	05/1
10	1.0	05/1
12	1.2	05/1
15	1.5	1
17	1.7	1
20	2.0	1
22	2.2	1
26	2.6	1
32	3.2	1
38	3.8	1

Code	cc/rev.	GR (Size)
43	4.3	1
48	4.8	1
60	6.0	1
63	6.3	1
78	7.8	1

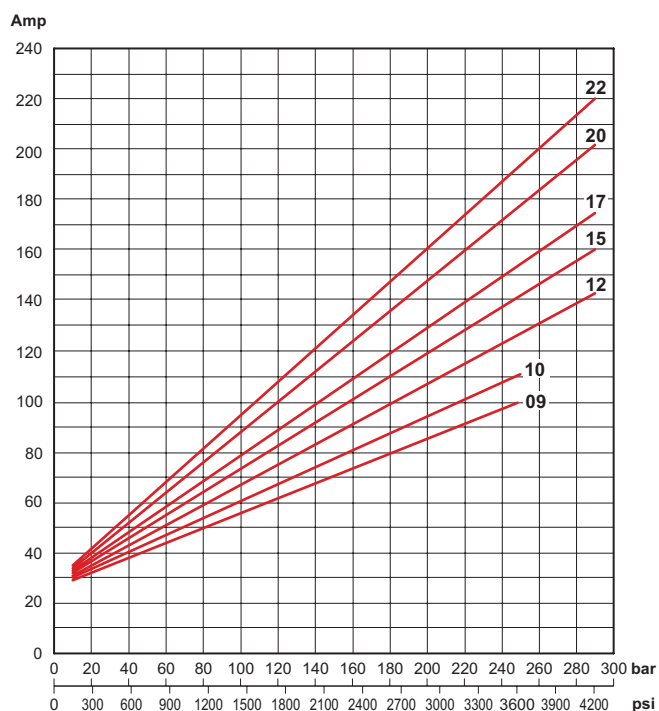
Performance with GR05 / GR1 pumps
Displacement 0.9 ÷ 2.2 cc/rev [0.055 ÷ 0.134 in³/rev]



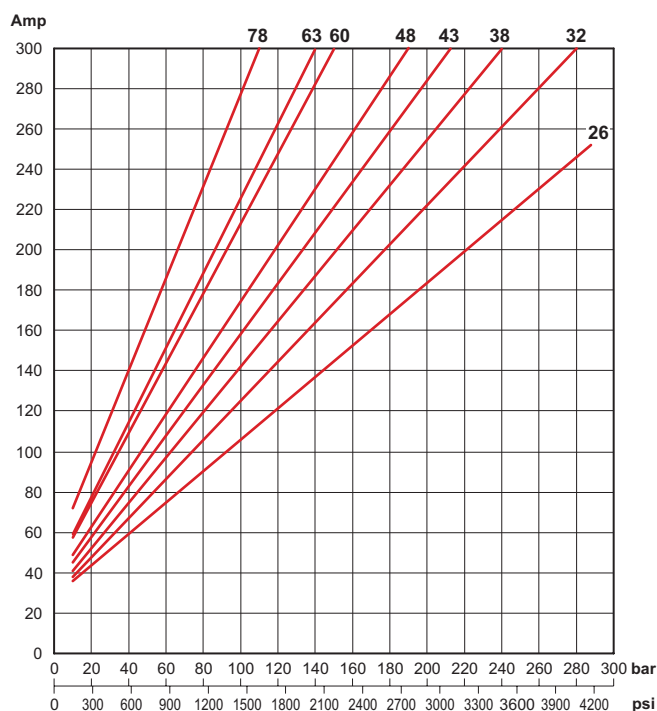
Performance with GR1 pumps
Displacement 2.6 ÷ 7.8 cc/rev [0.159 ÷ 0.476 in³/rev]



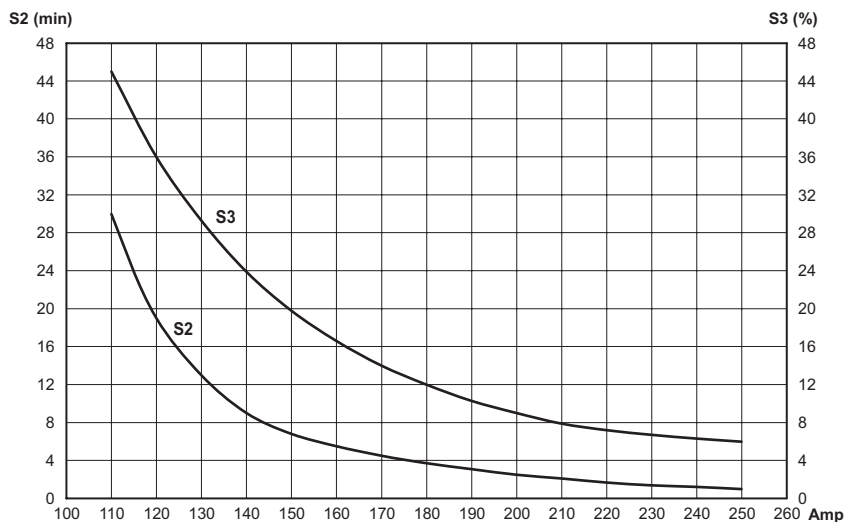
Current with GR05 / GR1 pumps
Displacement 0.9 ÷ 2.2 cc/rev [0.055 ÷ 0.134 in³/rev]



Current with GR1 pumps
Displacement 2.6 ÷ 7.8 cc/rev [0.159 ÷ 0.476 in³/rev]



Thermal characteristics S2 - S3



ORDERING CODE

Power pack	X mm [inch]	Code Fan cooled motor	Code Fan cooled motor with thermal swich	Code Fan cooled kit
FP	53.2 [2.09]	*	*	25017700
MC	43.4 [1.71]	*	*	25006100

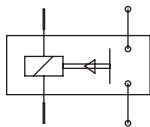
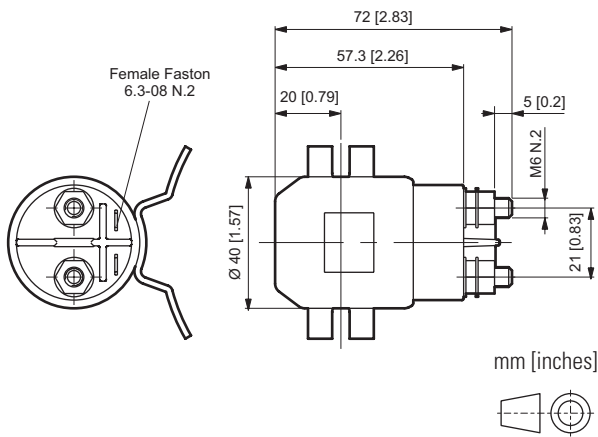
Code	Description
KIT07012.019	Starting switch kit 24VDC - 150A (fixing with screws)

* please contact our sales department

Reference data: maximum nominal pressure Pmax = 290 bar. Oil ISO VG32 tempera-
ture 35°C (viscosity 40 cSt), outside temperature 25°C.

Maximum nominal current Imax = 300A. Stabilized voltage to 24 Vdc detected at the
terminals of the electric motor.

Starting switch: 120A



Wiring diagram

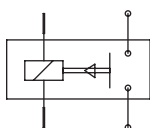
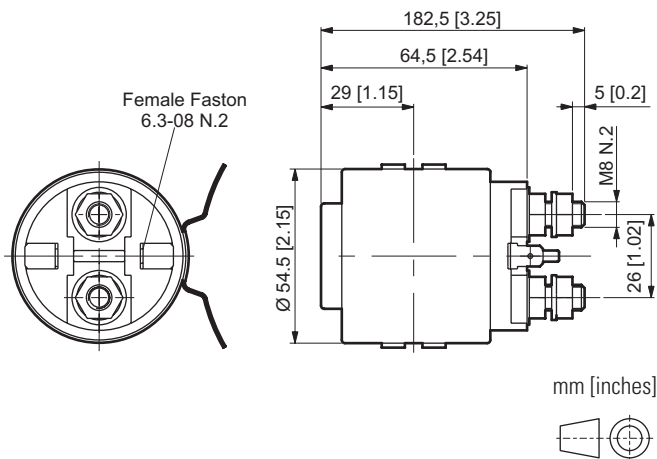
RATED FEATURES

Description	12 VDC	24 VDC
Min cut-on voltage	8.4 V @ 20°C 11 V @ 60°C	16.8 V @ 20°C 23 V @ 60°C
Rated voltage	12 VDC	24 VDC
Cut off voltage	0.6 ÷ 4 VDC	1.2 ÷ 8 VDC
Current consumption	1.9 ± 0.2 A	0.8 ± 0.1 A
Operating temperature range	-20 ÷ +60 °C	-20 ÷ +60 °C
Vibration specification	9 g	9 g
Rated Current	120 A	120 A
Coil short time duty	S2 = 15 min	S2 = 20 min
Protection degree	IP 67	IP 67
Weight	290 gr [0.69 lb]	320 gr [0.71 lb]

ORDERING CODE

Motor type	Code (12 VDC)	Code (24 VDC)
D. 80 fixing with clamp	KIT07012.027	KIT07012.032
D. 115 fixing with clamp	KIT07012.033	KIT07012.034
D. 115 fixing with screws	KIT07012.025	KIT07012.026

Starting switch: 150A



Wiring diagram

RATED FEATURES

Description	24 VDC
Min cut-on voltage	16.8 V @ 20°C 23 V @ 60°C
Rated voltage	24 VDC
Cut off voltage	1.2 ÷ 8 VDC
Current consumption	1.1 ± 0.1 A
Operating temperature range	-30 ÷ +60 °C
Vibration specification	9 g
Rated Current	150 A
Coil short time duty	S3= 10% @ 350A
Protection degree	IP 54
Weight	690 gr [1.52 lb]

ORDERING CODE

Motor type	Code (24 VDC)
D. 125 fixing with screws	KIT07012.019



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HATEC MCC-E 0112

DOC00053



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