Electro-Motor-Pumps ET

motion and progress

Classification: 440.10.20.10
Reference: 200-P-991029-E-00/03.05

Contents

1 General information

Electro-motor-pump is the simplest and more compact unit able to supply hydraulic power, as flow and pressure, to oil-dynamic actuators.
The Electro-motor-pumps are largely used on industrial operating machines particularly on mobile machines, where, through simple valves and hoses connections it makes possible to operate and control different hydraulics actuators.
In the present technical catalogue the most common versions, obtained as combination of DC motors and External Gear Pumps, either 05 (AP05) and 1 (AP100) group, are shown, although, many and different customised versions have been designed and realised in order to satisfy to specific and dedicated customer' requests.

Directives and standards

- Atex:

The equipment and protective systems of these catalogue ARE NOT intended for use in potentially explosive atmospheres that is to say where there is an explosive atmosphere referred to in Article 2 of the Directive 99/92/EC and referred to Article 1.3 of the Directive 94/9/EC.

- ISO 9001: 2000

Bucher Hydraulics S.p.A. is certified for research, development and production of directional control valves, power units, gear pumps and motors, electro pumps, cartridge valves and integrated operating blocks for hydraulic applications.

2 D.C. Electric motors

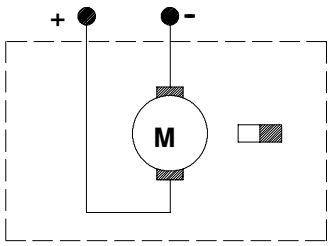
2.1 Technical information

Versions:
Available voltage: 12-24 V D.C.
Available power rating: 0.8 - 3 kW.
For other input voltage and power rating, consult our Sales Department.

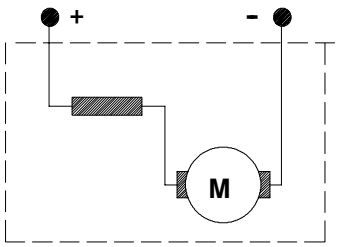
Direction of rotation:
Unless otherwise stated, all motors are specified clockwise rotation, suitable for driving counterclockwise pumps.

Type of winding:
D.C. motors can be manufactured with different types of field windings:
- Permanent magnets
- Series
- Compound

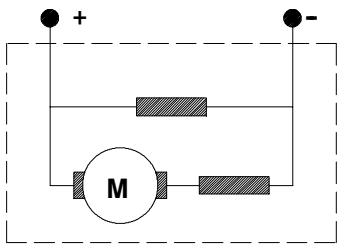
Permanent magnets



Series



Compound



Insulation class:

The class of electric insulation reflects the maximum temperature motor can register during operation without damage to the insulating material internally of motor itself.
The following table indicates insulation classes to CEI 15-26.

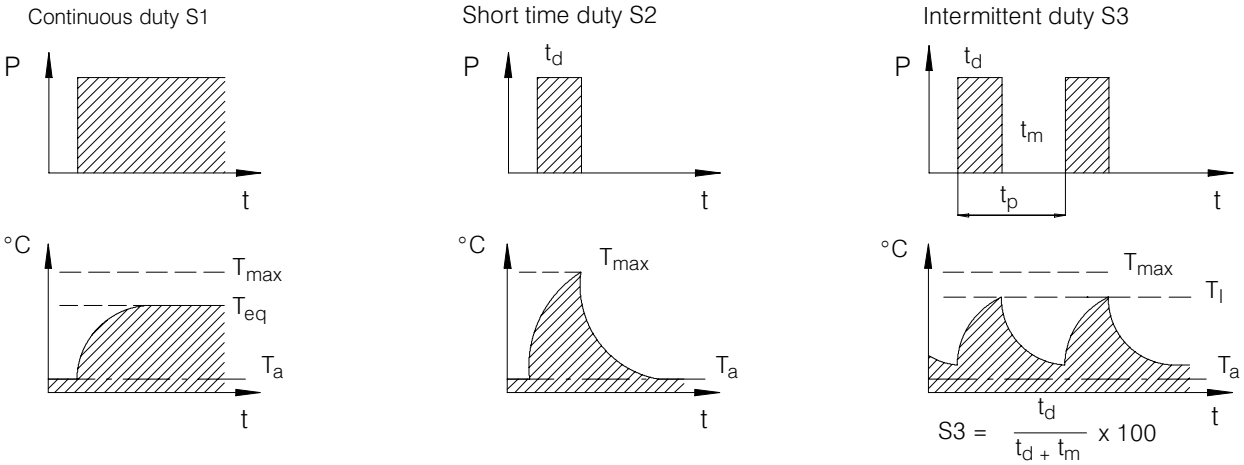
Class	Y	A	E	B	F	H
Temperature (°C)	90	105	120	130	155	180

Type of duty:
To ensure selection of the electric motor best suited to a given set of operating conditions, the duty cycle needs to be verified. Duty cycles S1, S2 and S3 are defined below in accordance with CEI 2-3

Continuous duty S1:
Operation on-load (Steady conditions) for a period of indefinite duration, during which the motor reaches thermal equilibrium without exceeding the maximum permissible temperature.

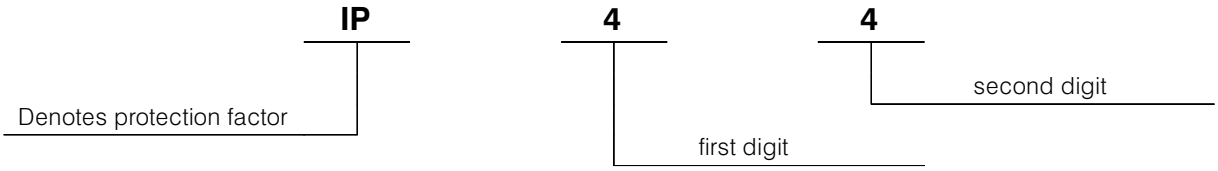
Short time duty S2
Operation on-load (steady conditions) for a period of limited duration, denoted td, during which maximum permissible temperature is reached, followed by an off-load period of duration sufficient for the temperature of the motor to return to ambient temperature.

Intermittent duty S3
A sequence of identical cycles, each 10 minutes in duration, the single cycle comprises a period of operation on-load (td), during which the motor may reach its maximum permissible temperature followed by an off-load period of limited duration (tm), insufficient for the temperature of the motor to return to ambient temperature. The value of S3 indicates the duration of the on-load period (td) in relation to the overall cycle time (tp), as a percentage.



P = load
T_{eq} = temperature at thermal equilibrium
T_{max} = maximum permissible temperature
T_I = operating temperature
T_a = ambient temperature
t_d = duration of on-load period
t_m = duration of off-load period
t_p = duration of cycle (10 min.)

Protection degree:
This indicates the level of protection afforded in preventing contact between live parts of the motor and people or foreign matter generally, and preventing the penetration of water.
The degree of protection is indicated in accordance with CEI 2-16 by the initials IP and two identifying digits:
Example:



The first digit indicates the degree of protection afforded to the motor against contact with people or foreign bodies.

0	no protection
1	protection against solid particles measuring > 50 mm
2	protection against solid particles measuring > 12 mm
3	protection against solid particles measuring > 2.5 mm
4	protection against solid particles measuring > 1 mm
5	protection against dust

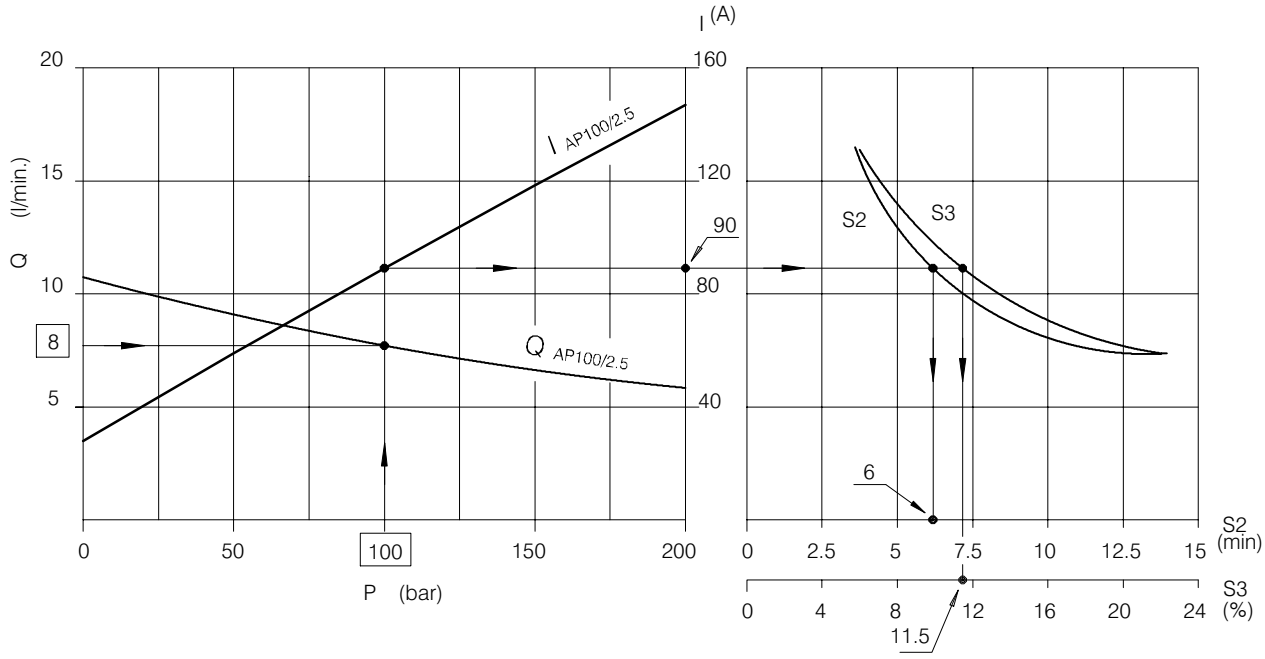
The second digit indicates the degree of protection afforded to the motor against the effects of penetration by water.

0	no protection
1	protection against water dripping vertically
2	protection against water dripping at 15° max
3	protection against rain
4	protected against water splash
5	protected against water spray

The degree of protection indicated for each individual electric motor refers to the motor when mounted to a Bucher Hydraulics S.p.A. electro-motor-pump.

2.2 Characteristic curves

Characteristic curves are given for each motors, from which to establish pressure, flow rate and current consumption values, and S2 and S3 duty cycles.



2.3 Example of how the graphs are used

Required data

Flow rate Q = 8 l/1'
Pressure p =100 bar

Pump displacement

Determined by the intersection of the required p and Q curves.
In the example indicated, pump AP100/2.5 has the required p and Q specifications.
In the event that there is no point of intersection with any curve, a displacement as near as possible to the required flow rate should be selected.

Current consumption

This is determined by taking a vertical line from the pressure value to its point of intersection with the I curve corresponding to the selected displacement.
In the example illustrated, current consumption is:
I = 90 Ampere

Type of use

Having established the current, the relationship of the S2 and S3 curves will give the following values:
S2 = 6 min. S3 = 11.5%

2.4 Mounting directions

The tie bolts must not be withdrawn completely when fitting motors, but retracted a short distance (30-50 mm max).
Once fitted to the electro-motor-pump, the motor should be run off-load momentarily (5 seconds max) to verify its correct operation: supply power to the windings and measure the current drain, which must not exceed the following values:
24 V motor - I < 35 Ampere
12 V motor - I< 70 Ampere

Power cable

The wire selected for power connections must be of cross section appropriate for the rated current of the motor.

Tightening torques

When assembling the motor and power pack and securing the wires of the power cable to the motor terminals, observe the tightening torque values indicated.

Brush life

The brushes will wear down progressively with continued operation of the motor, and must be replaced when reduced to their minimum useful length.
Since the rate of wear on the brushes is dictated by the operating conditions and cannot therefore be broadly specified, consult our Sales Department for guidance.

3 Gear pumps

3.1 Suitable fluids

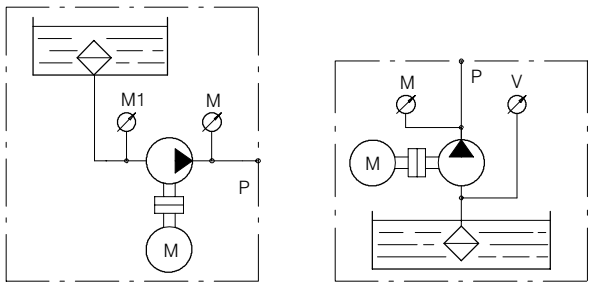
Only mineral oil based hydraulic fluids responding to ISO/ DIN standard should be used.
Viscosity range:
recommended 20 - 120 mm^2/s (cSt)
permissible up to 700 mm^2/s (cSt)
Operating temperature range: -15 +80 °C
For other fluids consult our Sales Department.

*** Caution! – Use of pumps at temperatures above 80°C must always be agreed upon with our Technical Office, and in any case this can cause a significant worsening in the volumetric efficiency.**
For use under conditions different from those indicated in this catalogue, please contact our Sales Department.

3.2 Inlet

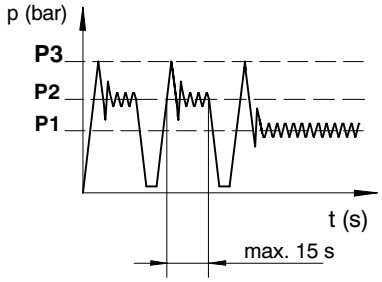
Absolute pressure at the pump inlet must be
V > 0.75 bar (11 PSI)
Accordingly, avoid:
- significant differences in height of pump and tank
- long pipeline runs
- sharp bends, restrictions, etc. causing turbulent flow

In certain applications, inlet pressure may be higher than 1 bar (14.3 PSI), or at any rate higher than atmospheric.
For pumps with standard configuration, the pressure registering at the gauge M1 should be:
M1 < 3.5 bar (50 PSI).



3.3 Outlet

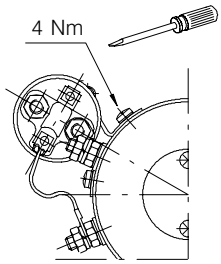
Pressure levels:
P1 = continuous operating pressure
P2 = intermittent operating pressure
P3 = peak pressure
The recommended delivery pipe oil speed is between: v = 2 - 5 m/s
In the next pages are indicated the performances for each pump.

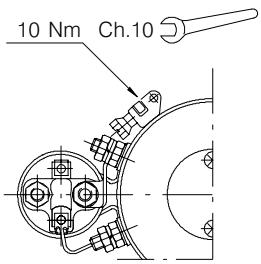


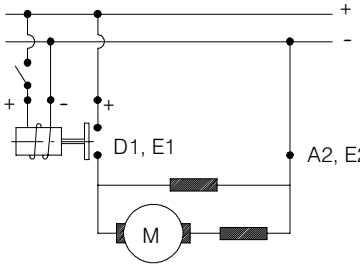
4 Starter relays

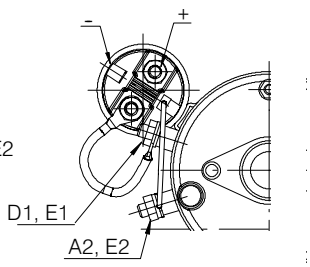
Technical information
Versions:
Available voltages: 12-24 V D.C.
Standard: suitable for most applications.
Heavy duty: for more arduous conditions
See relative table for technical data
Contact life:
The contacts of the relay will wear down progressively during operation.
Since the rate of wear is dedicated by the type of duty and cannot therefore be broadly specified, consult our Sales dept. for guideline information.
Fitment to electric motor
Starter relays can be fitted to the frame of the motor by two different methods:

1. Direct
The relay is secured with screws, using holes already tapped in motor frame. In this instance there is one standard mounting position only.
2. Metal clip
Suitable for standard relays only.
The relay is secured by means of a clip encircling the motor frame and inserted through special slots in the feet of the relay itself.
In this instance, several mounting positions are possible.
Electrical diagram
A typical arrangement for connection of the relay to the electric motor is shown in the diagram.

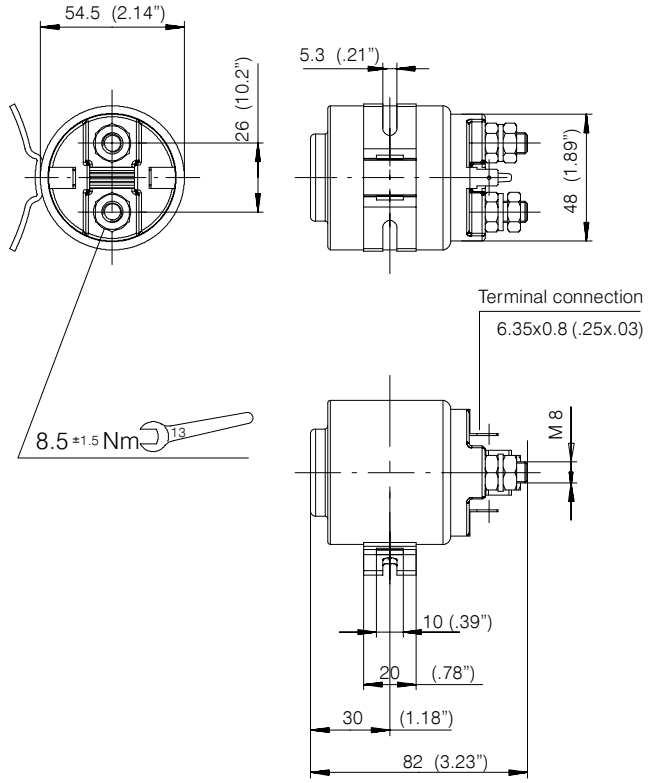




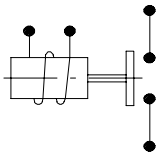




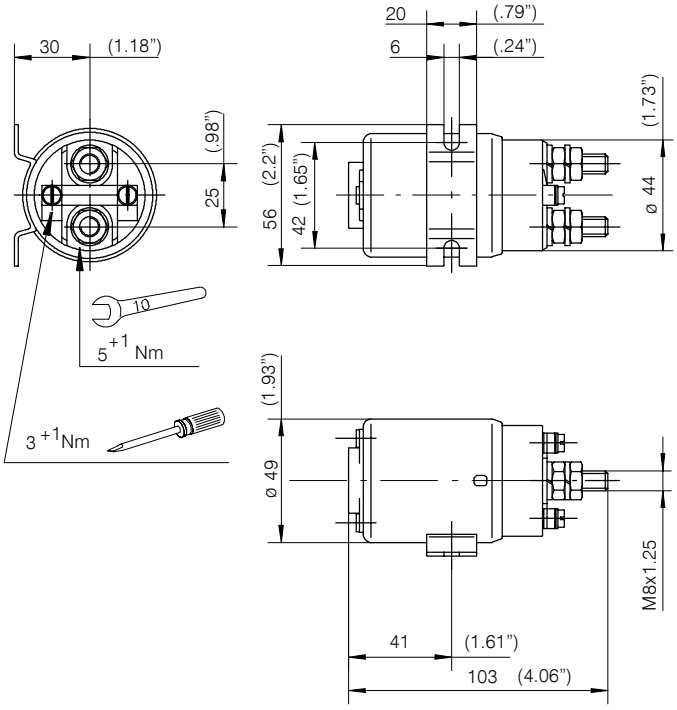
Motor starter relays



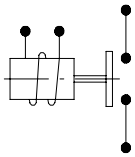
Weight : 0.70 Kg (1.52 lb)

Voltage	12 V	24 V
Type	**R106**	**R209**
Code	200.5441.34106	200.5441.34209
Amps Consumption by the coil	2.8 A	1.1 A
Current for continuous duty		80 A
Max. current (5 sec.)		500 A
Protection index		IP54
Insulation class		F
Electric diagram		

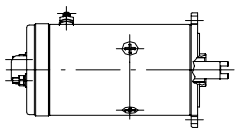
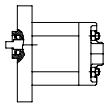
Heavy duty version

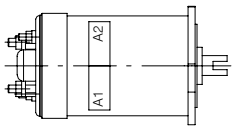
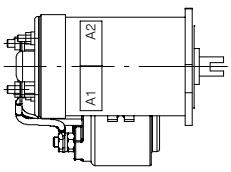
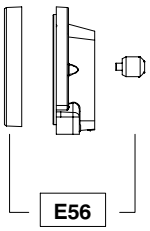
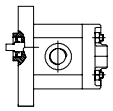
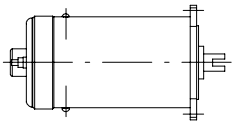
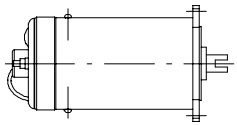
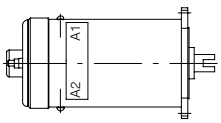
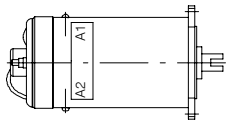
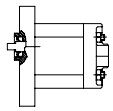


Weight : 0.78 Kg (1.69 lb)

Voltage	12 V	24 V
Type	**R107**	**R210**
Code	200.5441.34107	200.5441.34210
Amps Consumption by the coil	2 A	1.1 A
Current for continuous duty		150 A
Max. current (5 sec.)		800 A
Protection index		IP42
Insulation class		B
Electric diagram		

5 Electro-Motor-Pumps for group 05 pumps

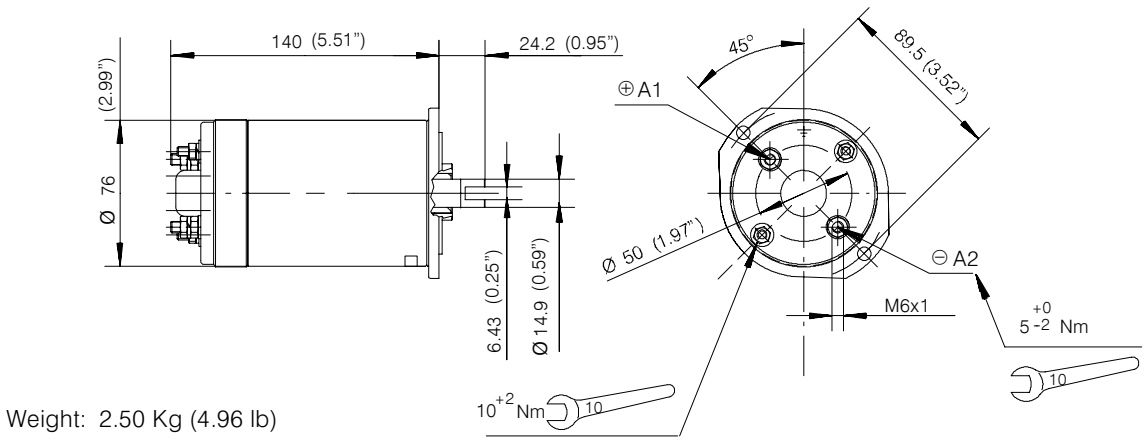
Motor	Drive/Flange	Pump
		

	Without starting relay	With starting relay	Drive/Flange	Pump
				
12V-350W 24V-400W	**C117PE/V0**	**C117PE/V0 + R106** **C220PE/Z0 + R209**		
				
				
12V-800W 24V-1200W	**C128AE/S0** **C232AE/R0**	**C128AE/S0 + R106** **C232AE/R0 + R209**	**E56**	**AP05/** S 819**
				
12V-800W 24V-900W	**C128PE/X0** **C229PE/Y0**	**C128PE/X0 + R106** **C229PE/Y0 + R209**		 **AP05/** S 319**

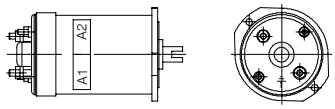
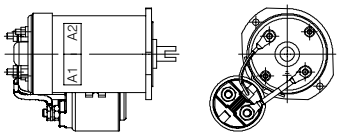
6 D.C. Electric motors for group 05 pumps

Voltage	12 V	24 V
Nominal Power	350 W	400W

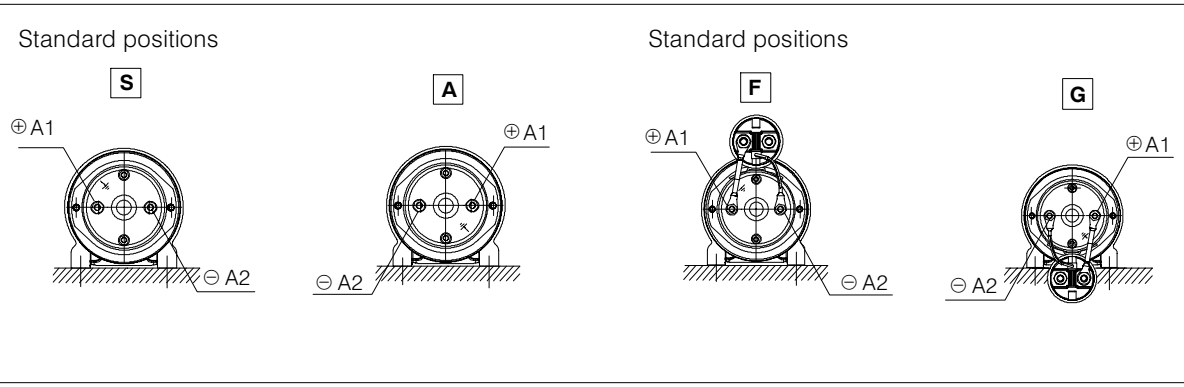
Protection index: IP42
Insulation class: . . . . . B
Type of winding: . . . . . Permanent magnets
Brushes kit: 200.5441.38021
Relay fixing kit 200.5441.08005
Minimum brushes length: . . . . . 6 mm (0.24 inches)



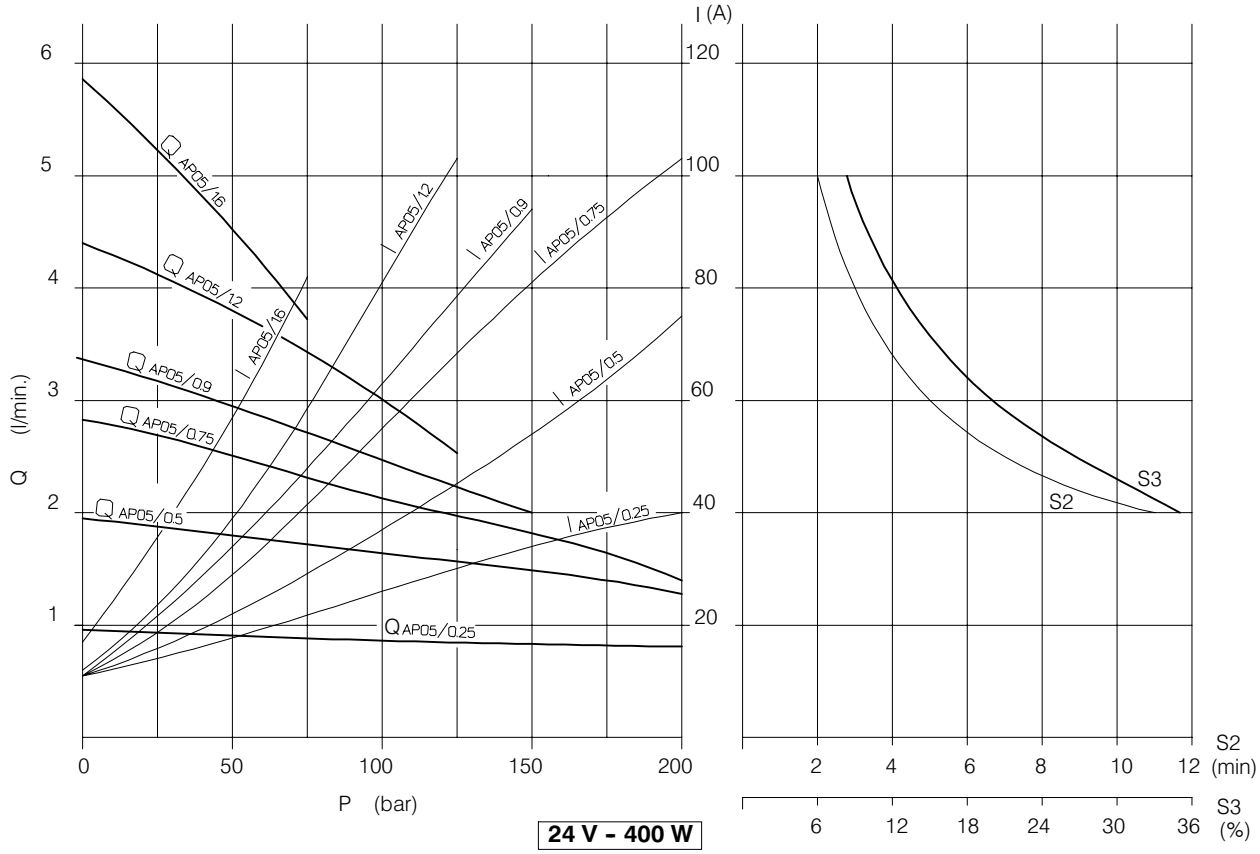
Weight: 2.50 Kg (4.96 lb)

Rotation Right	Motor		Motor with relay			
						
	12 V - 350 W	24 V - 400 W	12 V - 350 W	24 V - 400 W		
Type	**C117PE/V0**	**C220PE/Z0**	**C117PE/V0 + R106**	**C220PE/Z0 + R209**		
Code	200.5439.11701	200.5439.22001	200.7633.1013.0	200.7633.2013.0		
Relay			The standard single relay can be used for clock-wise rotation only			
Relay type			R106	R209		

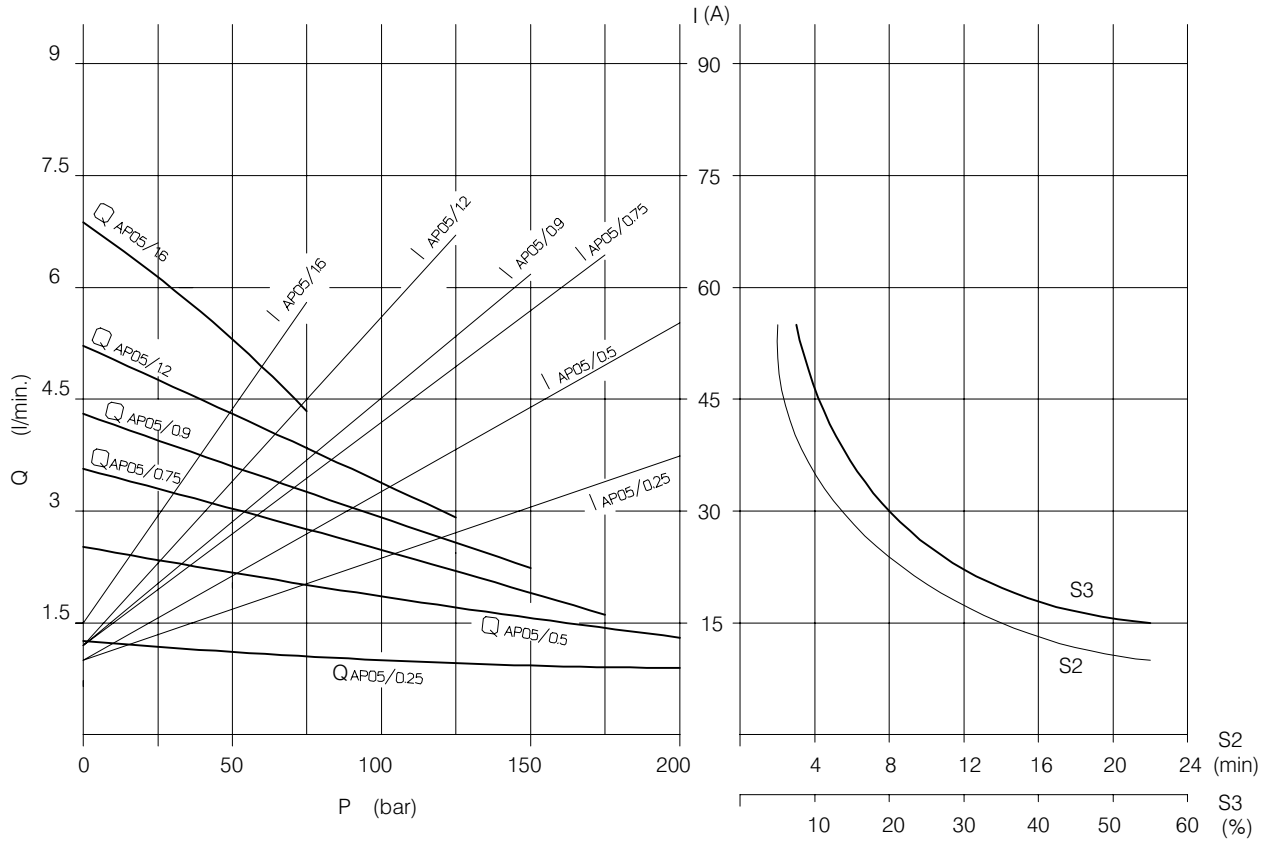
Motor mounting position



12 V - 350 W

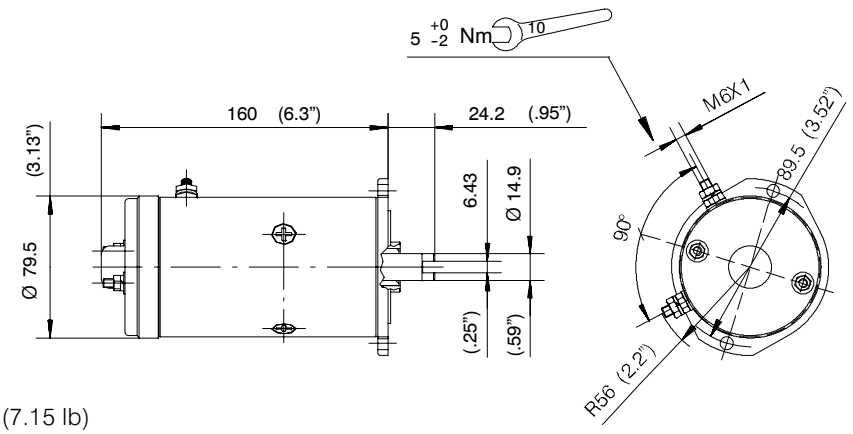


24 V - 400 W

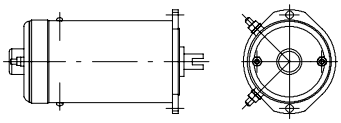
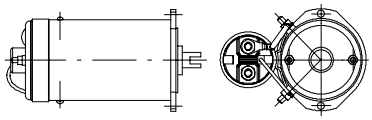


Voltage	12 V	24 V
Nominal Power	700 W	800 W

Protection index: IP42
Insulation class: . . . . . B
Type of winding: . . . . . Compound
Brushes kit: 200.5441.38017
Relay fixing kit 200.5441.08005
Minimum brushes length: . . . . . 5 mm (0.2 inches)



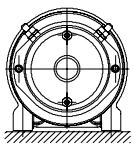
Weight: 3.250 Kg (7.15 lb)

Rotation Right	Motor		Motor with relay			
						
	12 V - 700 W	24 V - 800 W	12 V - 700 W	24 V - 800 W		
Type	**C128AE/S0**	**C232AE/R0**	**C128AE/S0 + R106**	**C232AE/R0 + R209**		
Code	200.5439.12804	200.5439.23203	200.7633.1014.0	200.7633.2014.0		
Relay			STANDARD			
Relay type			R106	R209		

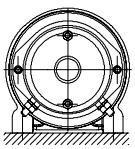
Motor mounting position

Standard positions

S

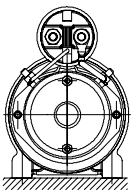


A

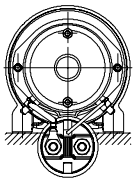


Standard positions

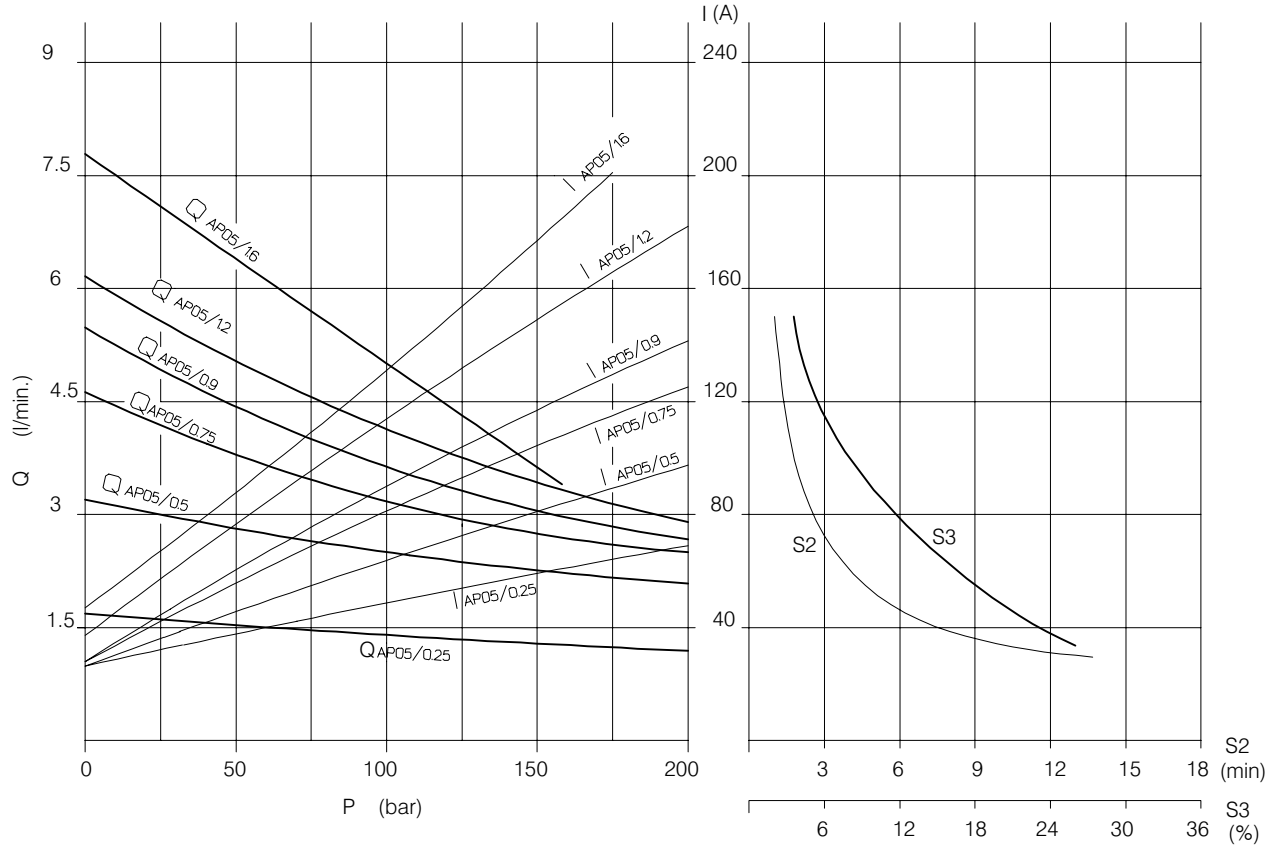
F



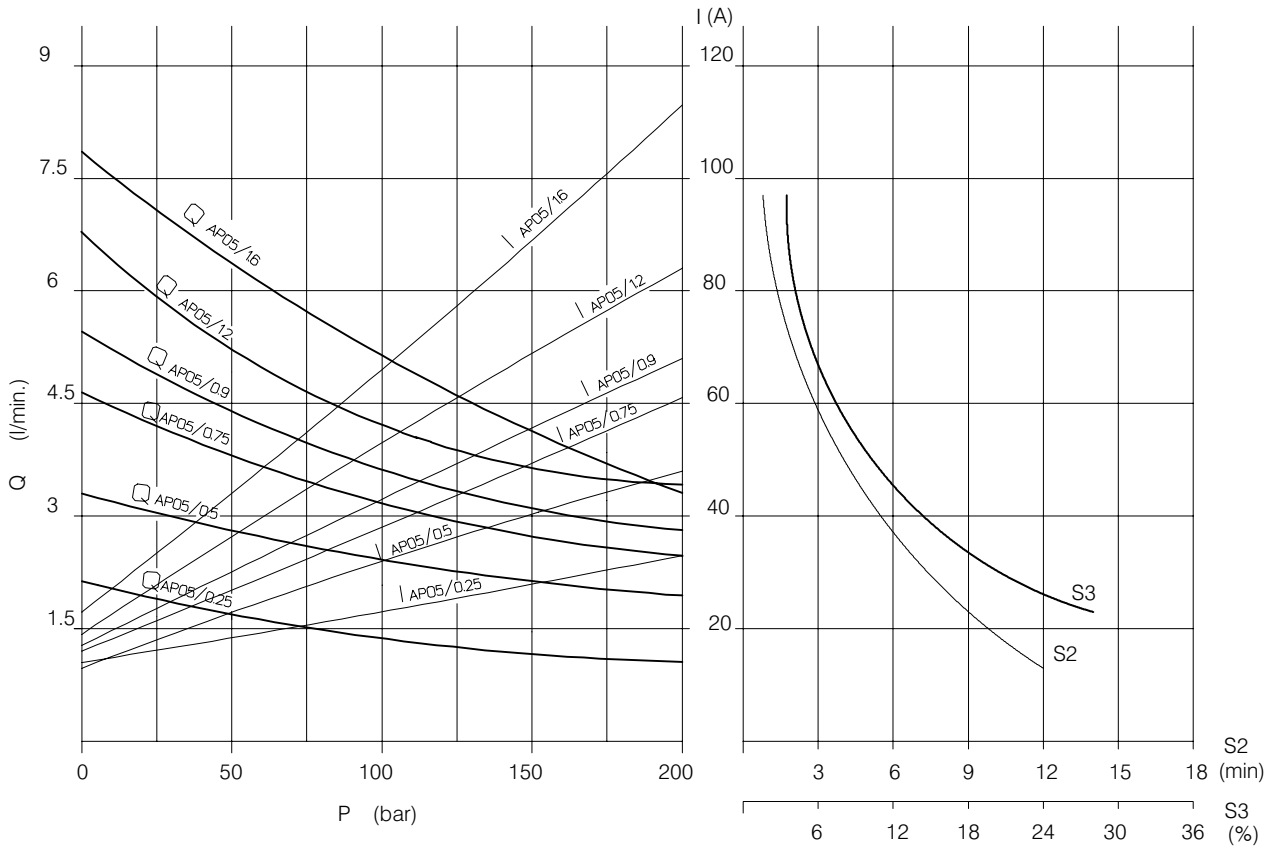
G



12 V - 700 W

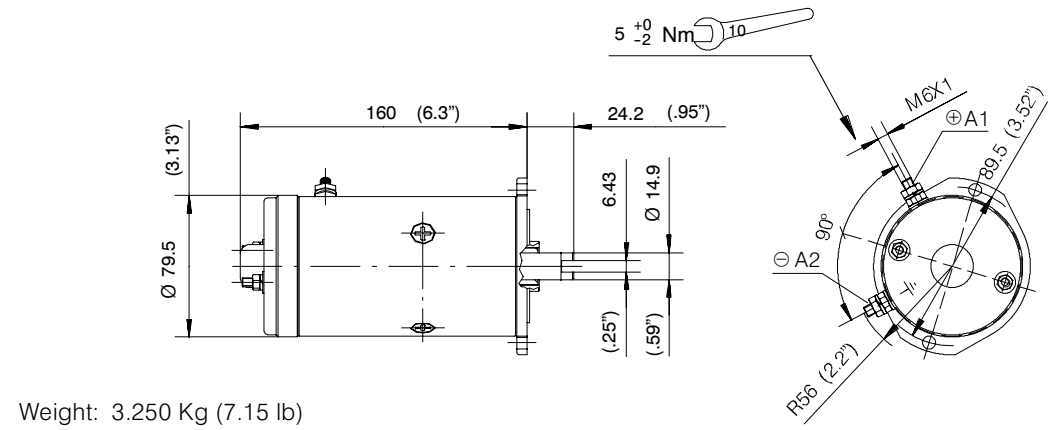


24 V - 800 W

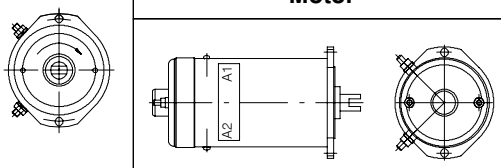
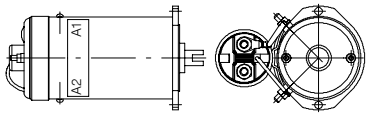


Voltage	12 V	24 V
Nominal Power	800 W	900W

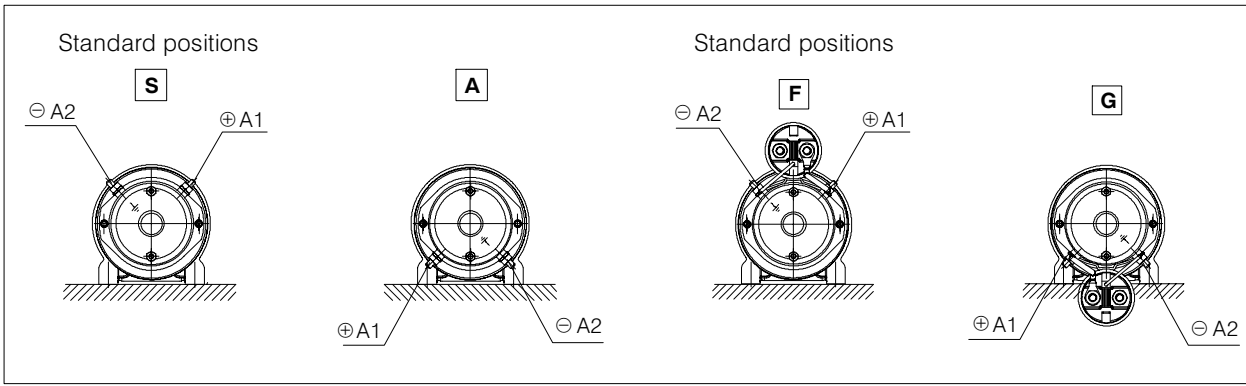
Protection index: IP42
Insulation class: . . . . . B
Type of winding: . . . . . Permanent magnets
Brushes kit: 200.5441.38017
Relay fixing kit 200.5441.08005
Minimum brushes length: . . . . . 5 mm (0.2 inches)



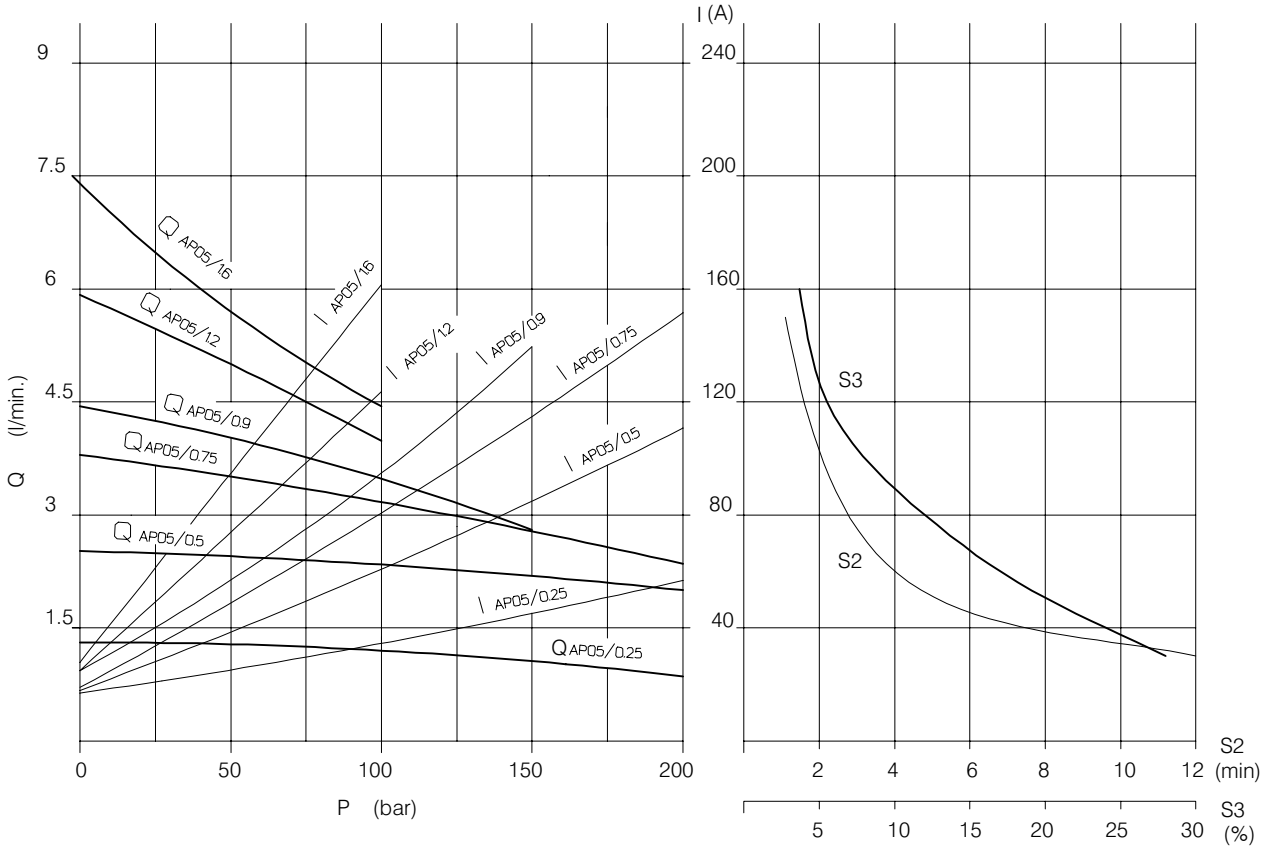
Weight: 3.250 Kg (7.15 lb)

	Motor		Motor with relay			
						
Rotation Right	12 V - 800 W	24 V - 900 W	12 V - 800 W	24 V -900 W		
Type	**C128PE/X0**	**C229PE/Y0**	**C128PE/X0 + R106**	**C229PE/Y0 + R209**		
Code	200.5439.12806	200.5439.22901	200.7633.1012.0	200.7633.2015.0		
Relay			The standard single relay can be used for clock-wise rotation only			
Relay type			R106	R209		

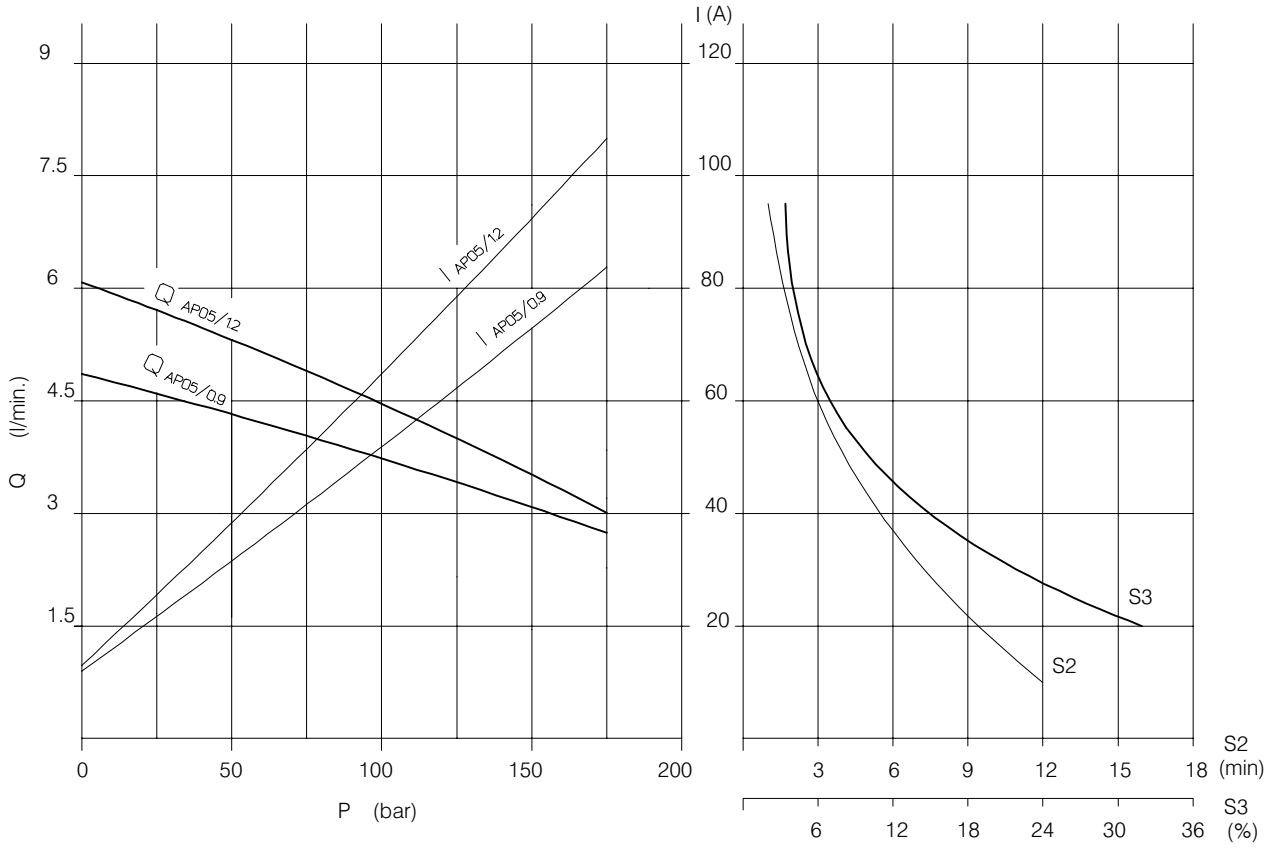
Motor mounting position



12 V - 800 W



24 V - 900 W

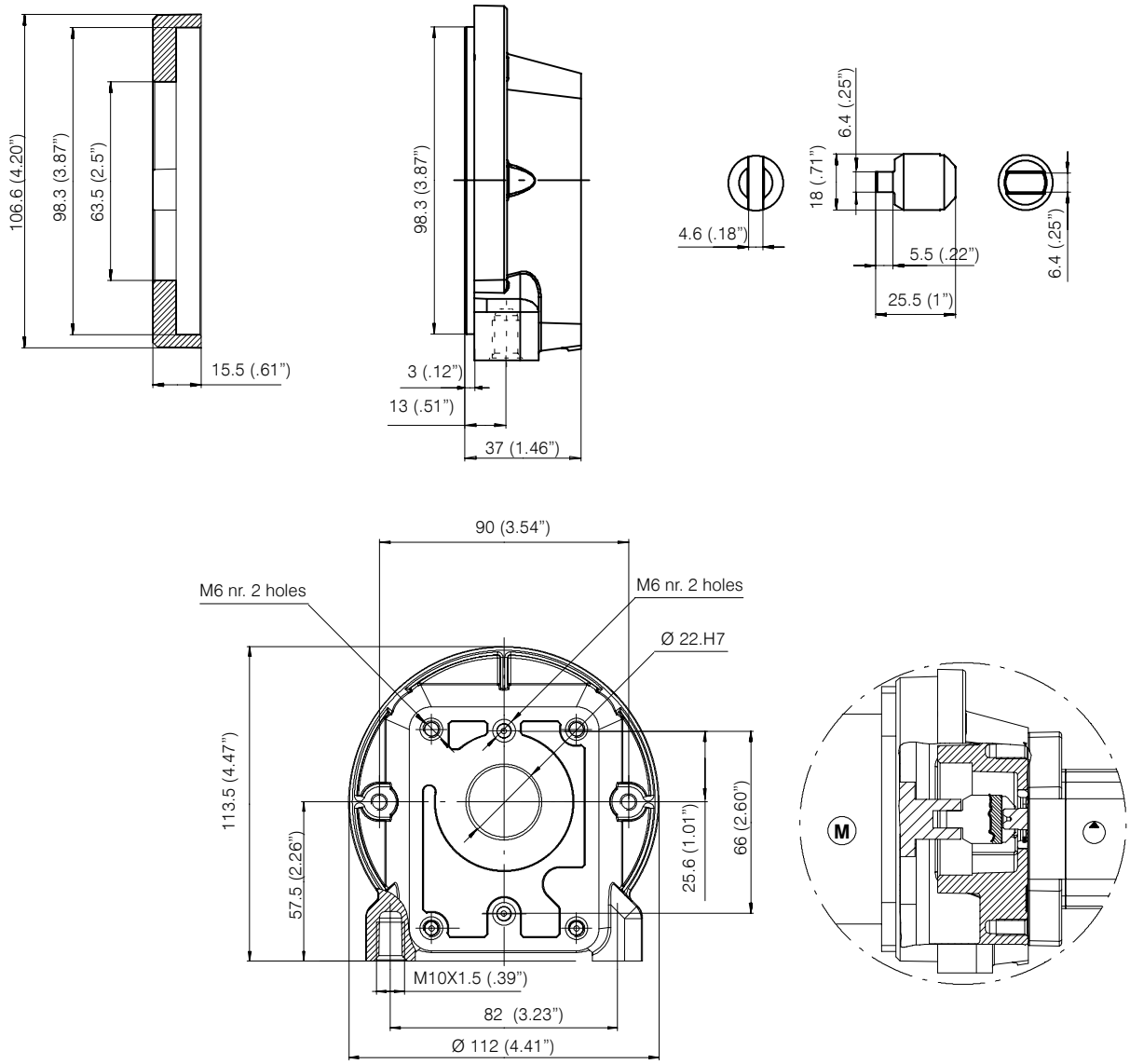


7 Drive and connecting flange for group 05 pumps

E56

E56 code: 200.7604.0032.0

Adaptor code: 200.6581.0003.0 | Connecting flange code: 200.6581.0001.0 | Coupling code: 200.6596.0026.0

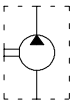


The complete code includes also:

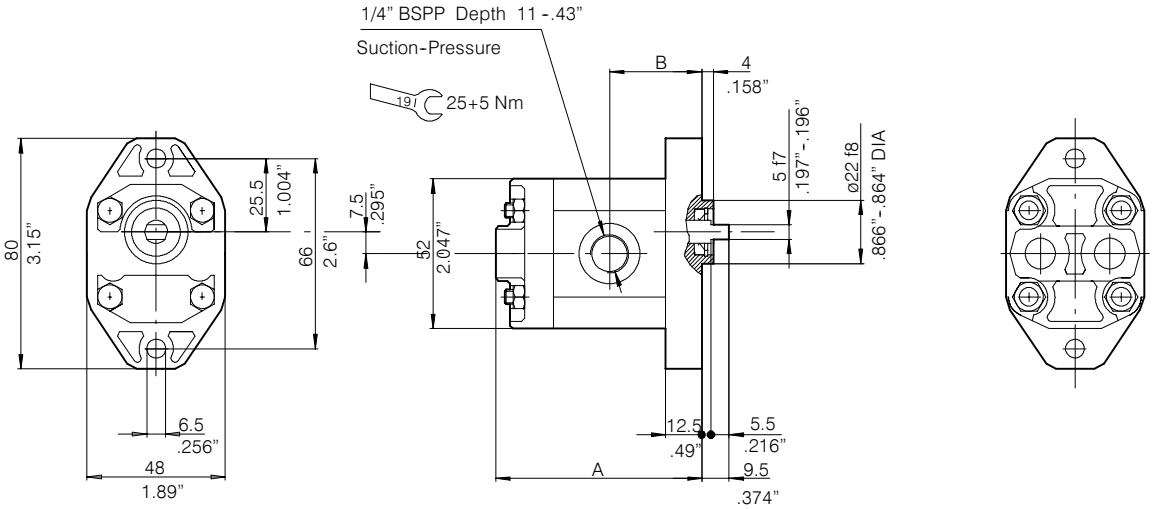
+ 2 screw code: 200.5216.03015 (M006x035)
+ 2 screw code: 200.5216.03012 (M006x022)
+ 4 washer code: 200.5303.90611

8 Group 05 gear pumps

AP05	Displacement		Max. pressure						n min.		n max.	
Type	cm^3/rev	Cu. In. P. R.	P1		P2		P3		P ≤ P1	P > P1	P ≤ P1	P > P1
			bar	P.S.I.	bar	P.S.I.	bar	P.S.I.				
AP05/0.25	0.25	.015	170	2400	180	2600	200	2900	800	1000	6000	7000
AP05/0.5	0.5	.030	190	2700	210	3000	230	3300	650	800	6000	7000
AP05/0.75	0.75	.045	190	2700	210	3000	230	3300	650	800	6000	7000
AP05/0.9	0.9	.055	190	2700	210	3000	230	3300	650	800	6000	7000
AP05/1.2	1.2	.073	170	2400	180	2600	200	2900	550	700	5000	6000
AP05/1.6	1.6	.097	170	2400	180	2600	200	2900	550	700	5000	6000

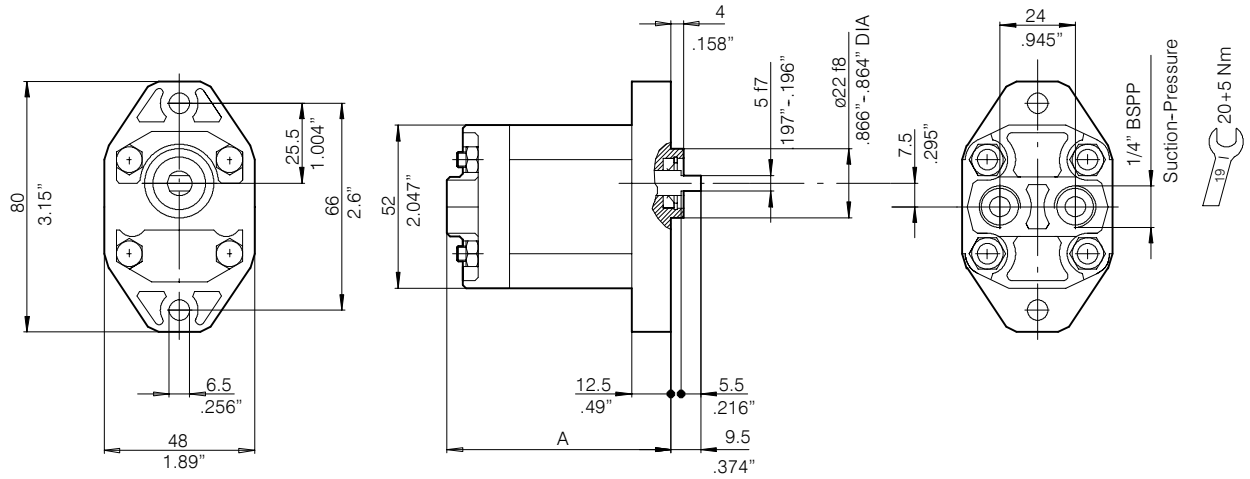


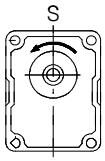
Group **AP05** Code **819**



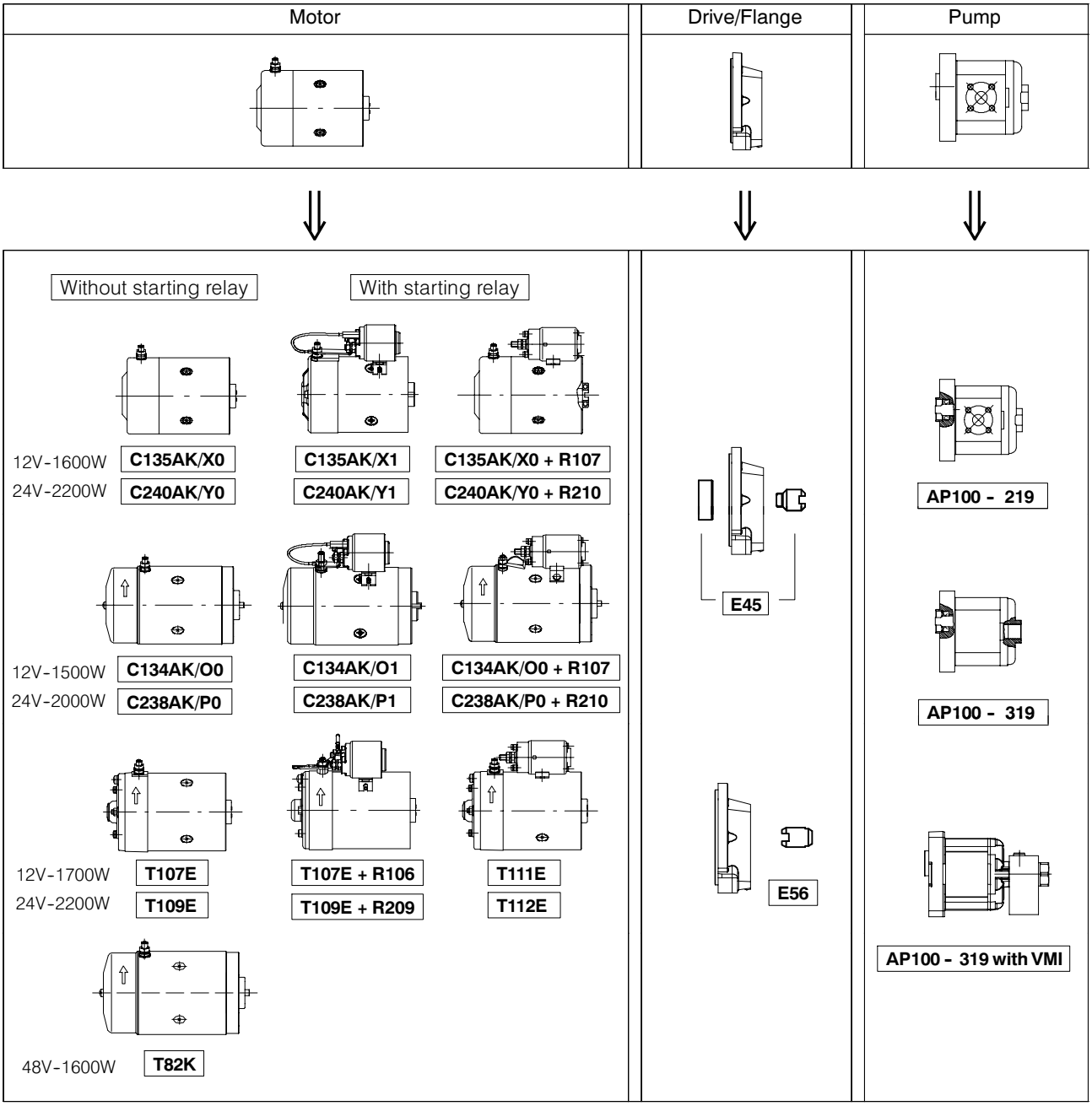
Type	Displacement cm^3/rev	Dimensions				Order code Counterclockwise rotation: S	
		A		B			
		mm	inches	mm	inches		
AP05/0.25	0.25	64.5	2.54	29	1.41	**200.1002.643.04**	S
AP05/0.5	0.5	67	2.64	30.5	1.2	**200.1003.643.02**	
AP05/0.75	0.75	69	2.72	31.5	1.24	**200.1004.643.02**	
AP05/0.9	0.9	70.5	2.77	32.3	1.26	**200.1005.643.04**	
AP05/1.2	1.2	73	2.87	33.5	1.32	**200.1006.643.02**	
AP05/1.6	1.6	77	3.03	35.5	1.40	**200.1008.643.01**	

Group **AP05** Code **319**



Type	Displacement cm³/rev	Dimensions A		Order code Counterclockwise rotation: S	
		mm	inches		
AP05/0.25	0.25	64.5	2.54	**200.1002.143.01**	
AP05/0.5	0.5	67	2.64	**200.1003.143.01**	
AP05/0.75	0.75	69	2.72	**200.1004.143.01**	
AP05/0.9	0.9	70.5	2.77	**200.1005.143.01**	
AP05/1.2	1.2	73	2.87	**200.1006.143.01**	
AP05/1.6	1.6	77	3.03	**200.1008.143.01**	

9 Electro-Motor-Pumps for group 1 pumps



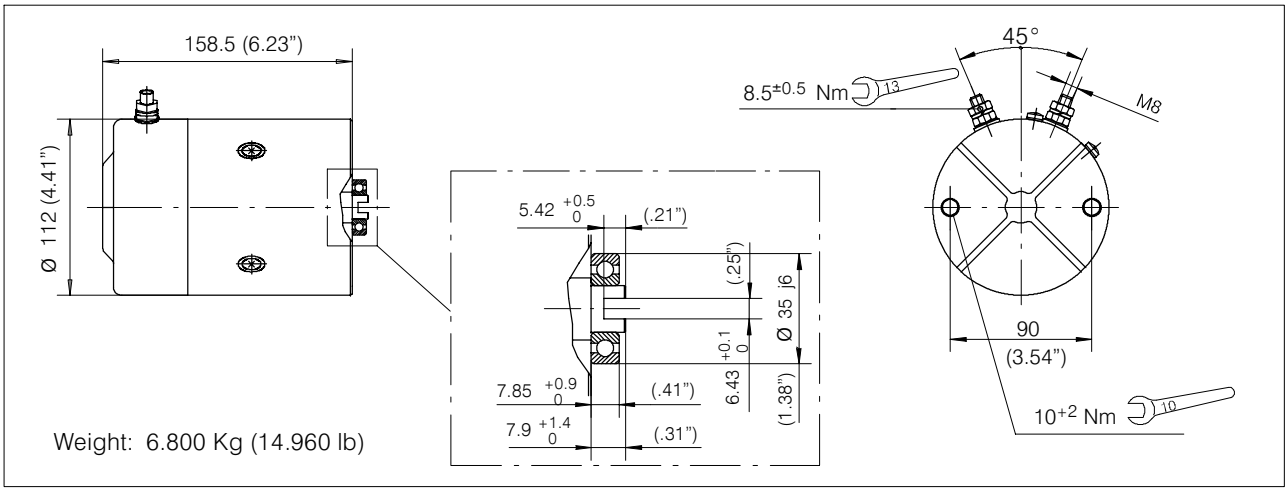
El. motor	E45	E56
C135AK/XO	●	
C135AK/X1	●	
C135AK/XO +R107	●	
C240AK/Y0	●	
C240AK/Y1	●	
C240AK/Y0 +R107	●	
C134AK/O0		●
C134AK/O1		●
C134AK/O0 +R107		●

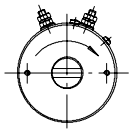
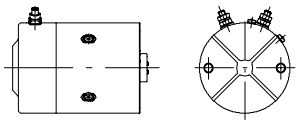
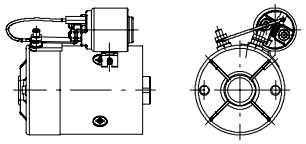
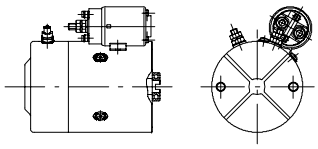
El. motor	E45	E56
C238AK/P0		●
C238AK/P1		●
C238AK/P0 +R107		●
T107E	●	
T107E + R106	●	
T111E	●	
T109E	●	
T109E + R209	●	
T112E	●	
T82K		●

10 D.C. Electric motors for group 1 pumps

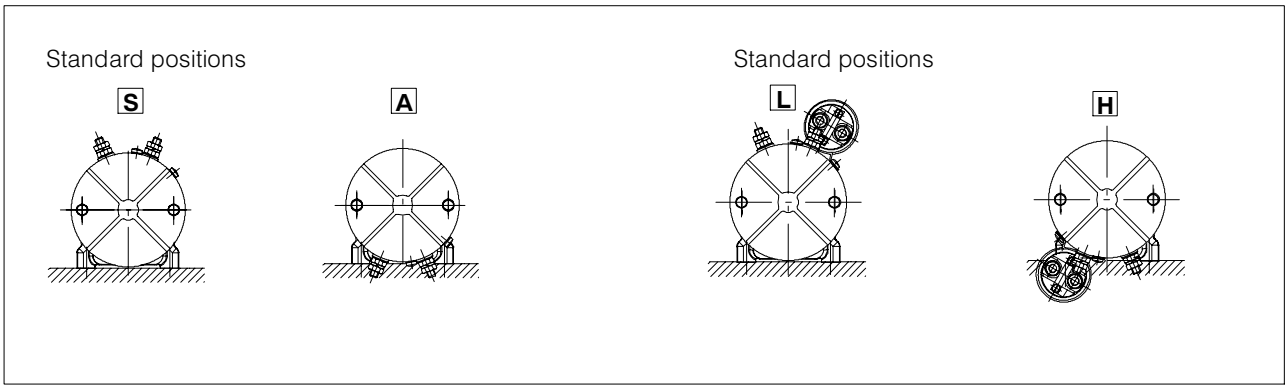
Voltage	12 V	24 V
Nominal Power	1600 W	2200 W

Protection index: IP44
Insulation class: . . . . . F
Type of winding: . . . . . Compound
Brushes kit: . . . . . (12/1600) 200.5441.38022
. . . . . (24/2200) 200.5441.38023
Minimum brushes length: . . . . . 12.5 mm (0.5 inches)

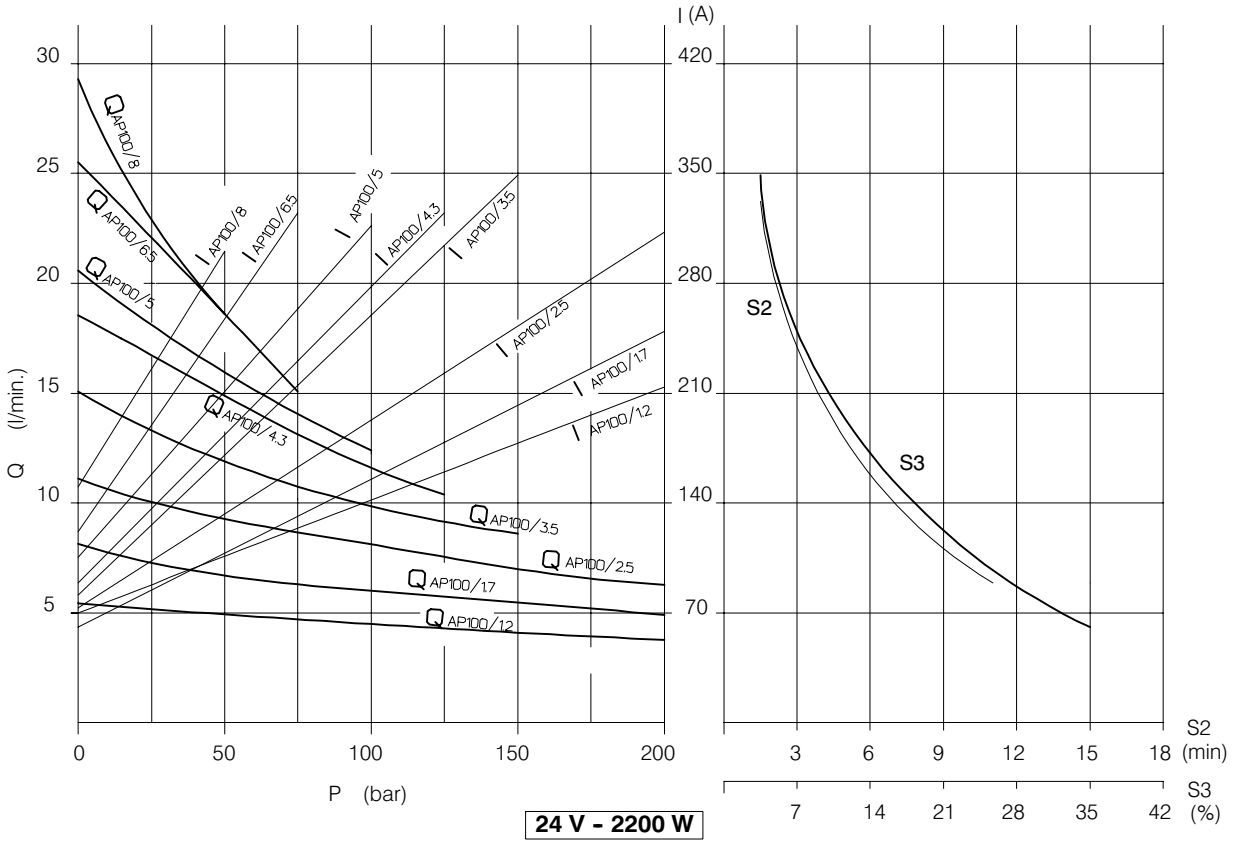


Rotation Right	Motor		Motor with relay			
						
	12 V - 1600 W	24 V - 2200 W	12 V - 1600 W	24 V - 2200 W	12 V - 1600 W	24 V - 2200 W
Type	**C135AK/X0**	**C240AK/Y0**	**C135AK/X1**	**C240AK/Y1**	**C135AK/X0 +R107**	**C240AK/Y0 +R210**
Code	200.5439.13501	200.5439.24001	200.5439.1350.3	200.5439.2400.2	200.7633.1009.0	200.7633.2009.0
Relay			Standard		Heavy duty	
Relay type			R106	R209	R107	R210
					Standard positions only	

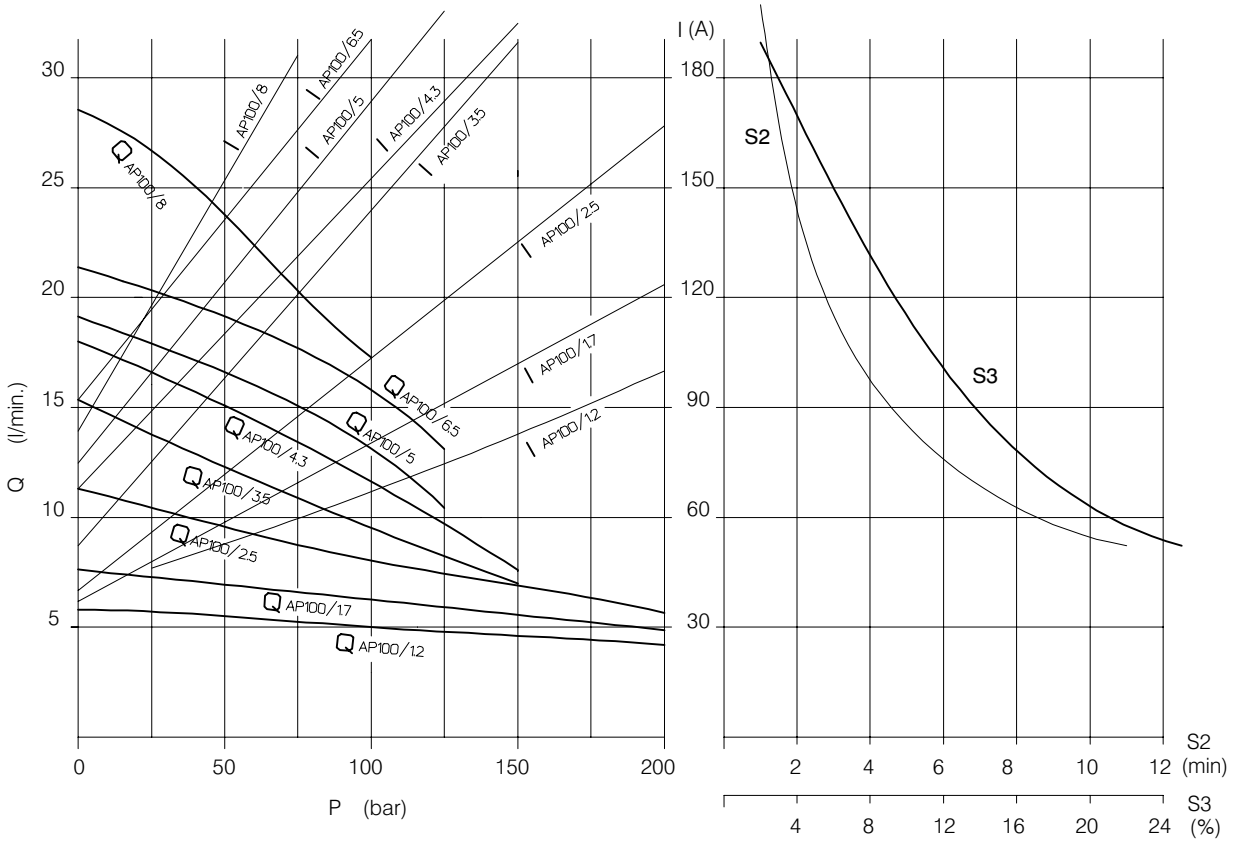
Motor mounting position



12 V - 1600 W

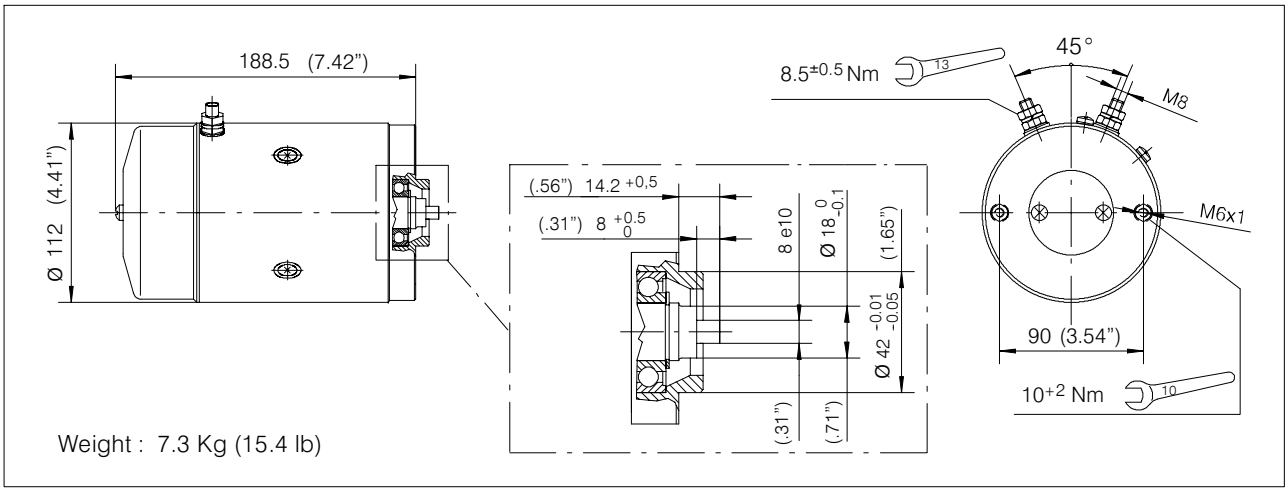


24 V - 2200 W

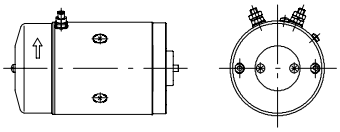
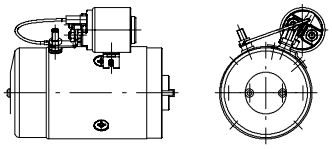
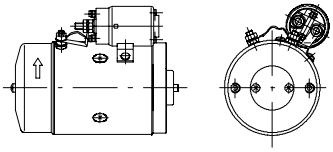


Voltage	12 V	24 V
Nominal Power	1500 W	2000 W

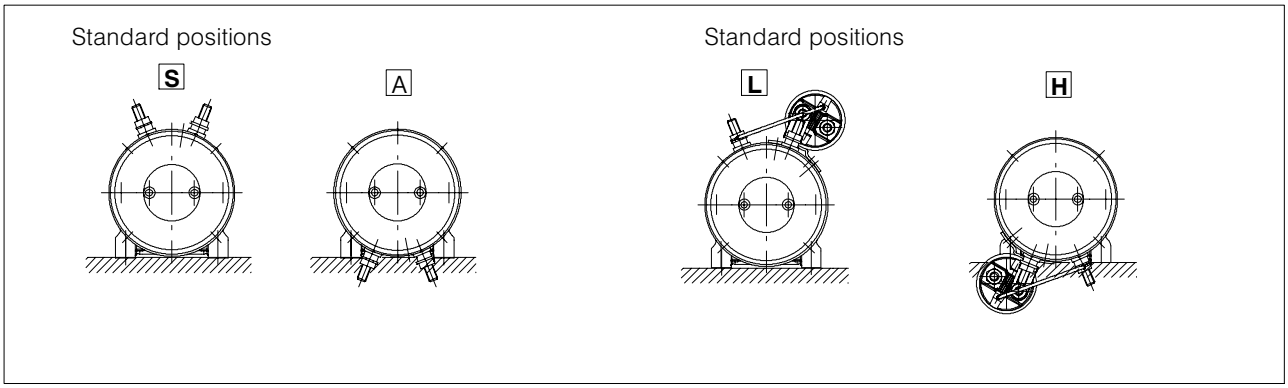
Protection index: IP54
Insulation class: . . . . . F
Type of winding: . . . . . Compound
Brushes kit: . . . . . (12/1500) 200.5441.38016
. . . . . (24/2000) 200.5441.38015
Minimum brushes length: . . . . . 12.5 mm (0.5 inches)



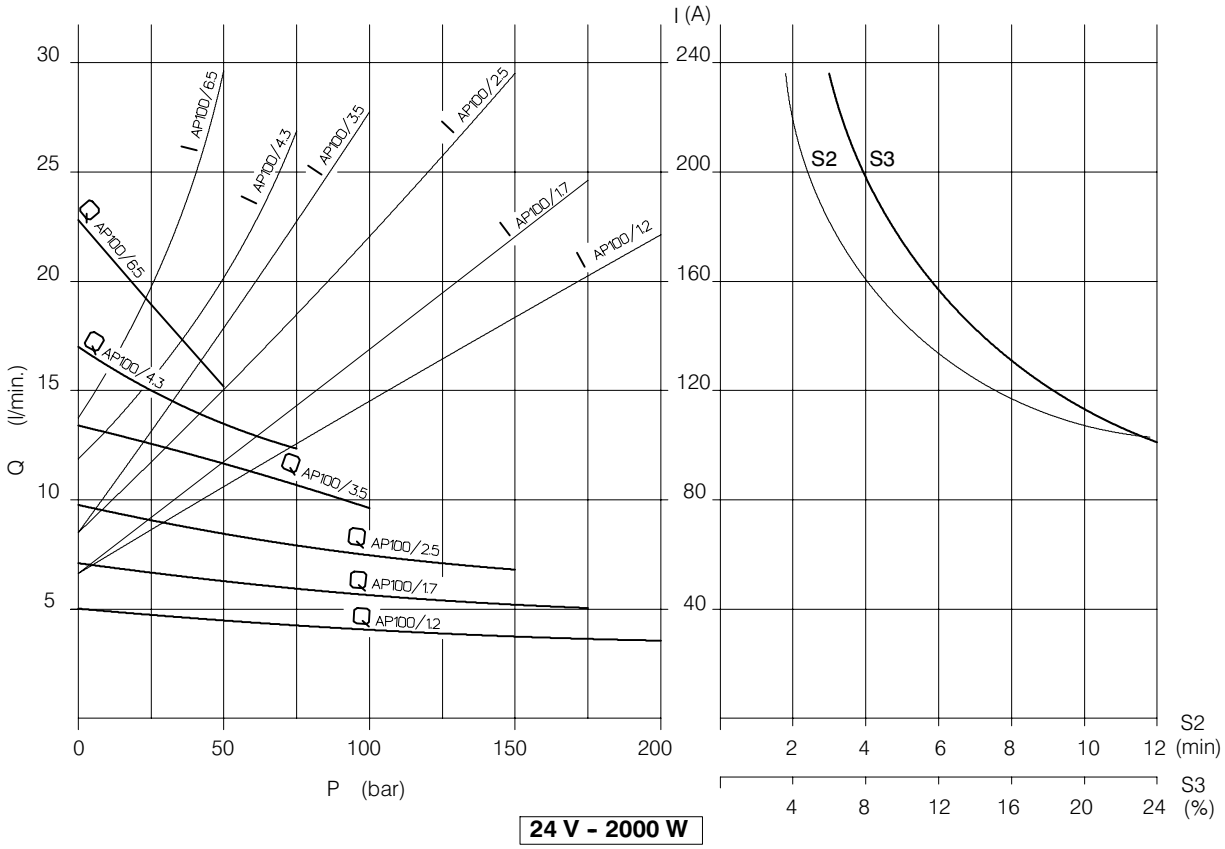
Weight : 7.3 Kg (15.4 lb)

Rotation Right	Motor		Motor with relay			
						
	12 V - 1500 W	24 V - 2000 W	12 V - 1500 W	24 V - 2000 W	12 V - 1500 W	24 V - 2000 W
Type	**C134AK/O0**	**C238AK/P0**	**C134AK/O1**	**C238AK/P1**	**C134AK/O0 +R107**	**C238AK/P0 +R210**
Code	200.5439.13416	200.5439.23813	200.5439.1341.9	200.5439.2381.7	200.7633.1003.0	200.7633.2005.0
Relay			Standard		Heavy duty	
Relay type			R106	R209	R107	R210
					Standard positions only	

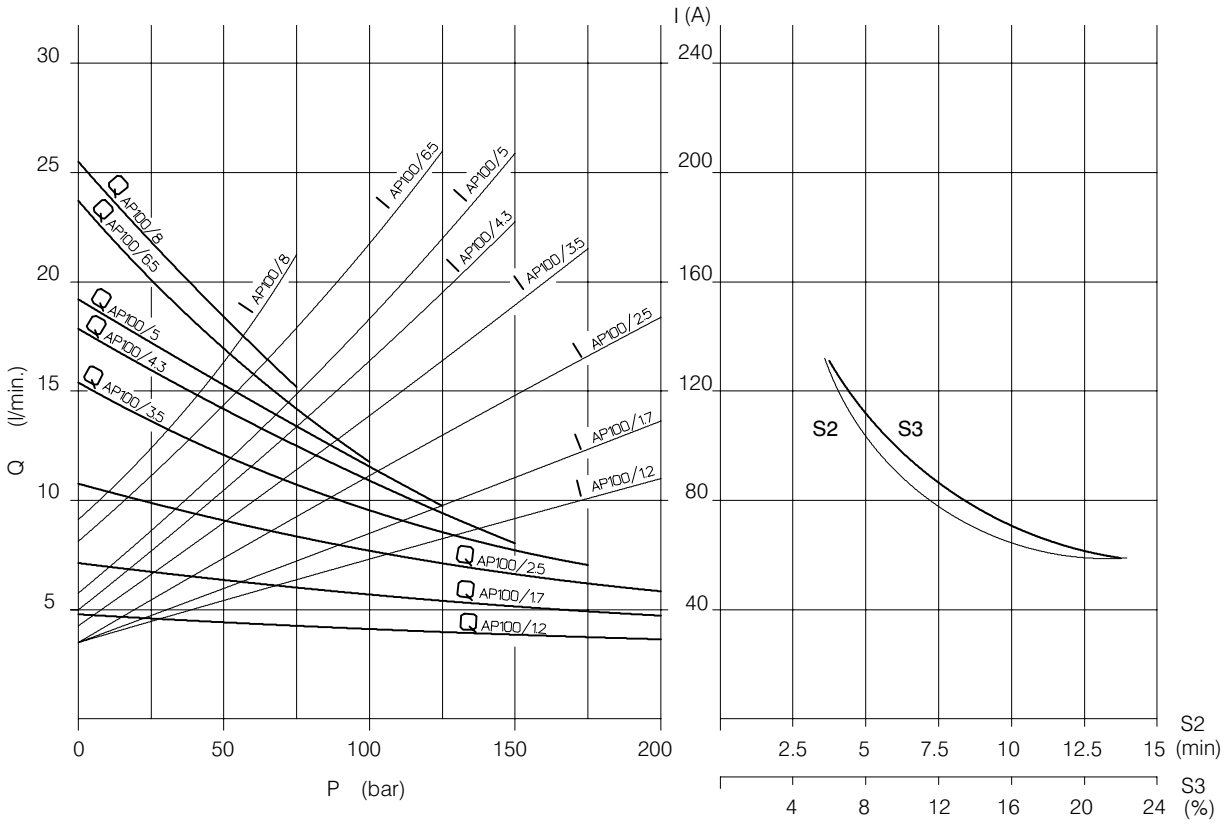
Motor mounting position



12 V - 1500 W

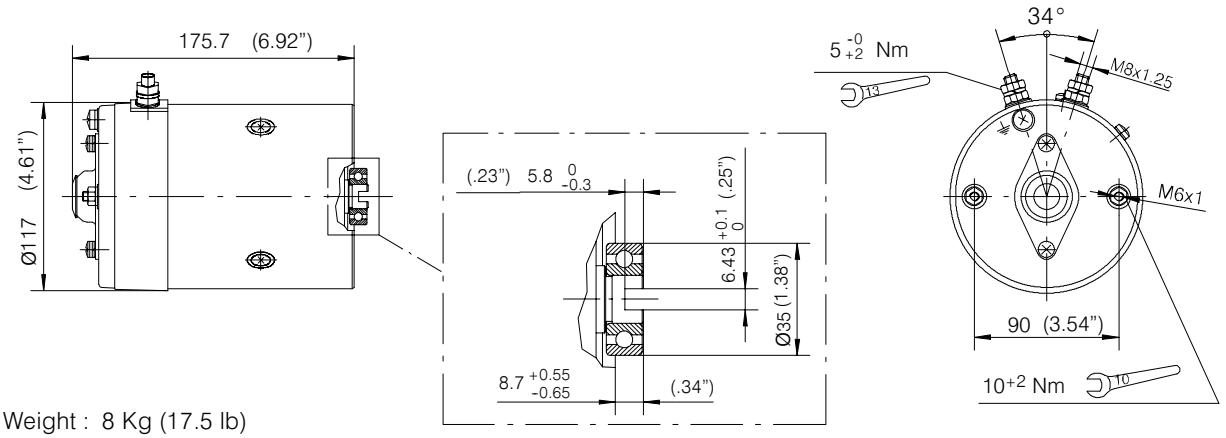


24 V - 2000 W

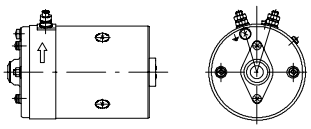
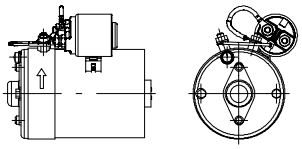
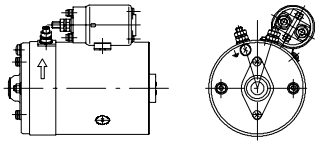


Voltage	12 V	24 V
Nominal Power	1700 W	2200 W

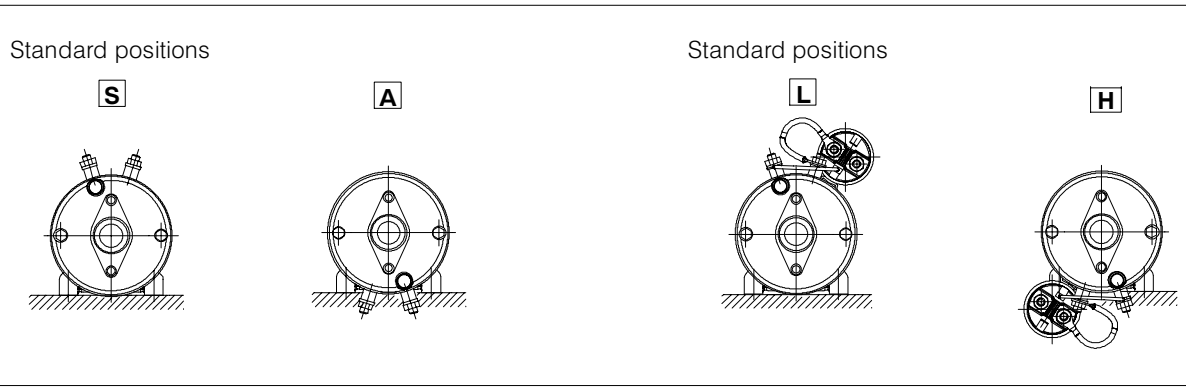
Protection index: IP42
Insulation class: . . . . . B
Type of winding: . . . . . Compound
Brushes kit: . . . . . (12/2000-24/2500) 200.5441.38012
Minimum Brushes length: . . . . . 5 mm (0.2 inches)



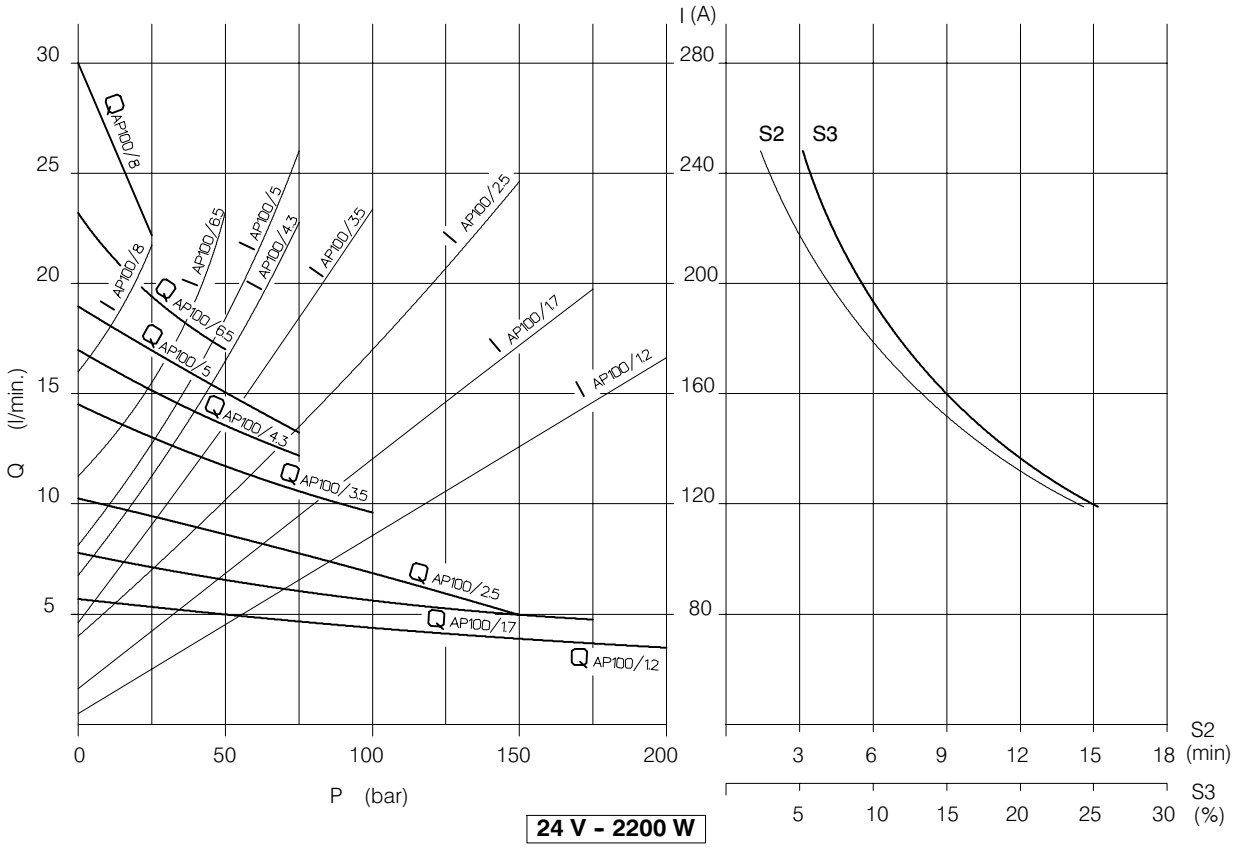
Weight : 8 Kg (17.5 lb)

Rotation Right	Motor		Motor with relay			
						
	12 V - 1700 W	24 V - 2200 W	12 V - 1700 W	24 V - 2200 W	12 V - 1700 W	24 V - 2200 W
Type	**T107E**	**T109E**	**T107E + R106**	**T109E + R 209**	**T111E**	**T112E**
Code	200.5439.13806	200.5439.24205	200.7633.1016.0	200.7633.2017.0	200.5439.13808	200.5439.24207
Relay			Standard		Heavy duty	
Relay type			R106	R209	R107	R210
					Standard positions only	

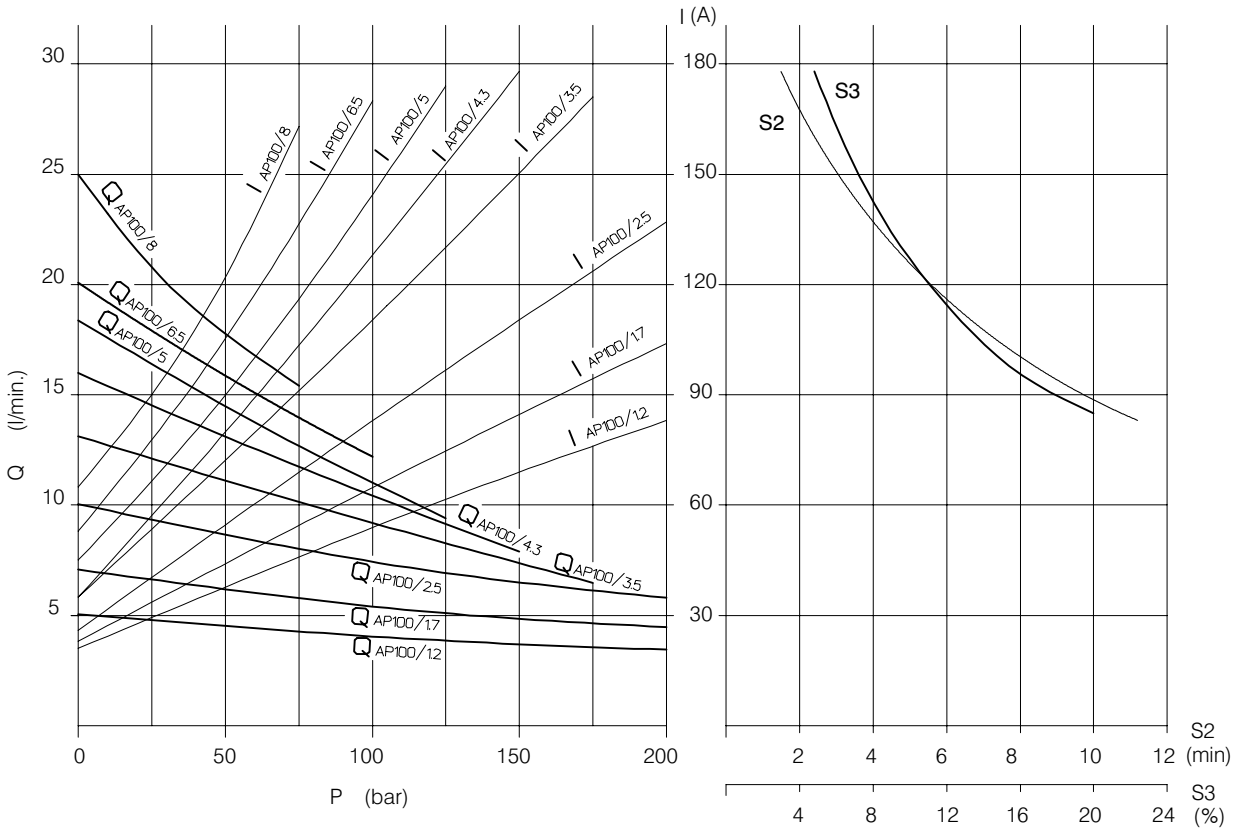
Motor mounting position



12 V - 1700 W

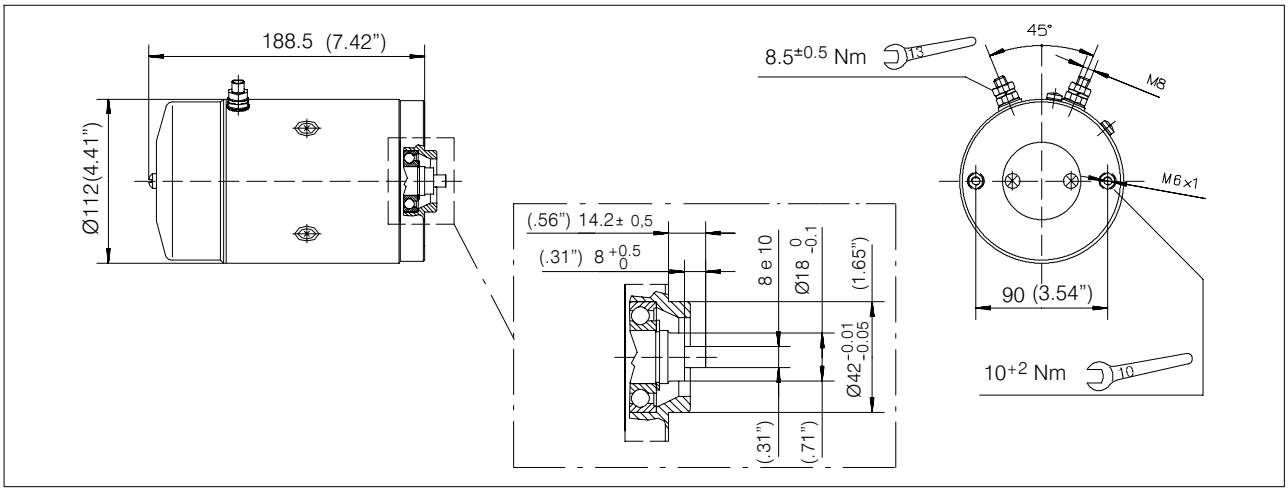


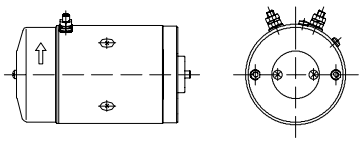
24 V - 2200 W



Voltage	48V
Nominal Power	2000 W

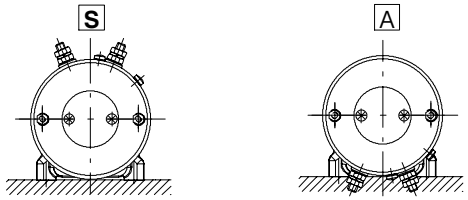
Protection index: IP54
Insulation class: . . . . . F
Type of winding: . . . . . Compound
Brushes kit: 200.5441.38018
Minimum brushes kit: . . . . . 12.5 mm (0.5 inches)



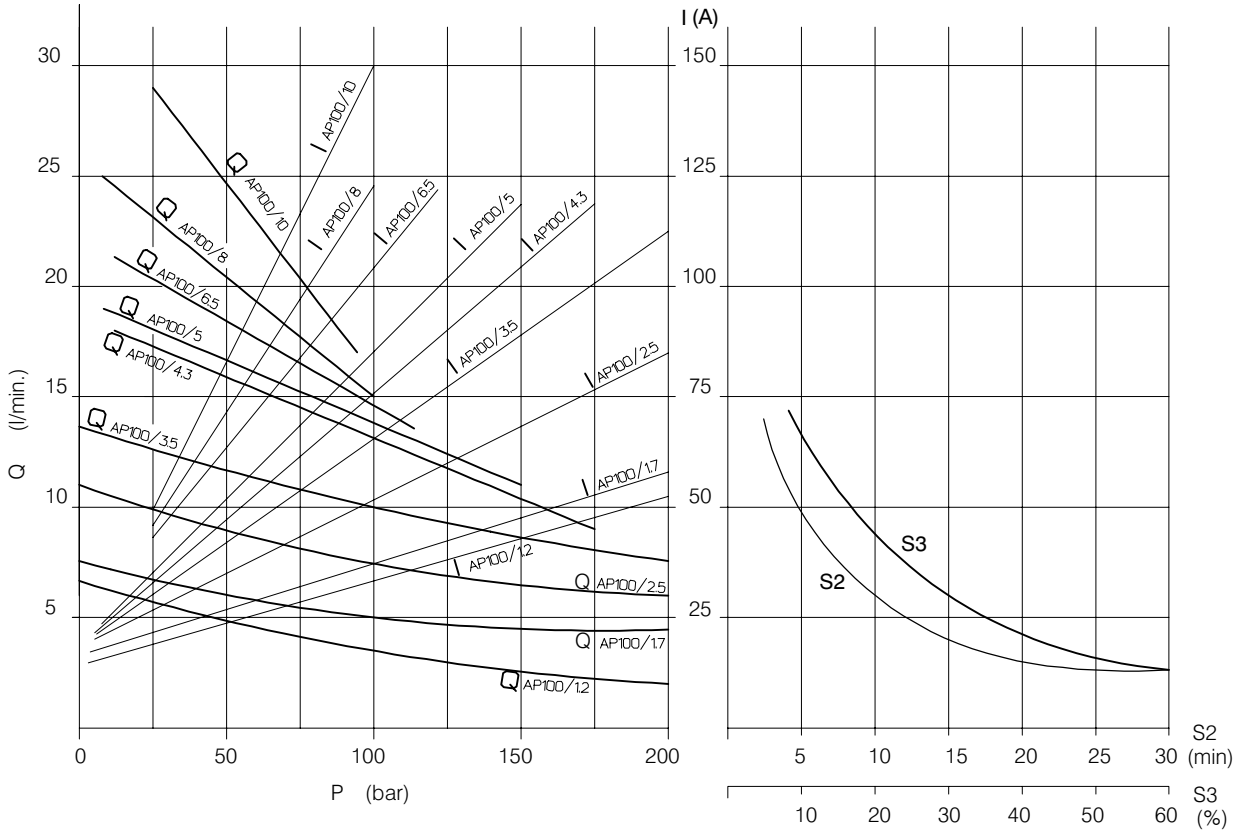
	Motor	
Rotation Right		
	48 V - 2000 W	
Type	**T82K**	
Code	**200.5439.33803**	
Relay		
Relay type		

Motor mounting position

Standard positions



48 V - 2000 W

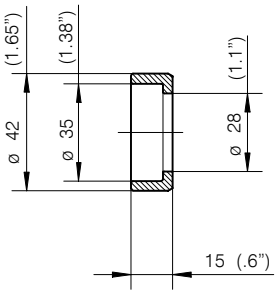

Q (l/min.)
I (A)
P (bar)
AP100/10
AP100/8
AP100/6.5
AP100/5
AP100/4.3
AP100/3.5
AP100/2.5
AP100/1.7
AP100/1.2
S2
S3
S2 (min)
S3 (%)

11 Drives and connecting flange for group 1 pumps

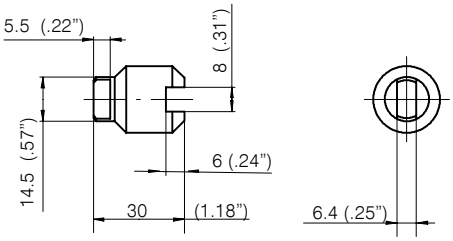
E45

E45 code: 200.7604.0017.0

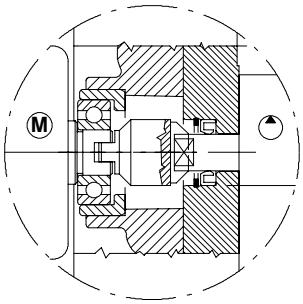
Bush code: 200.6582.0006.1

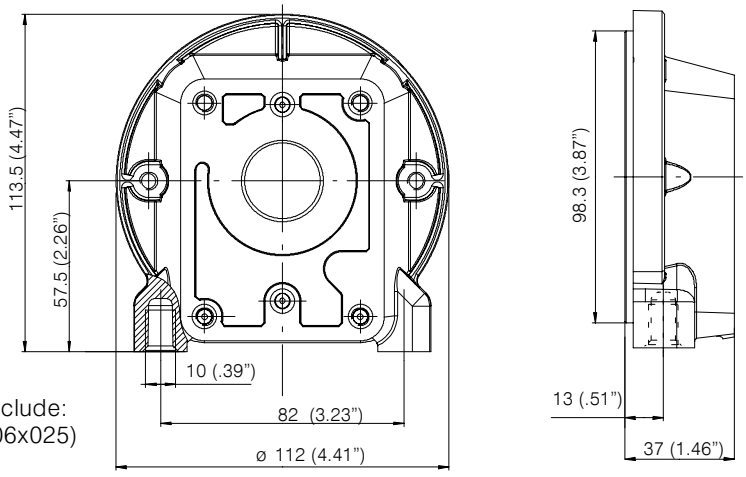


Coupling code: 200.6596.0006.0



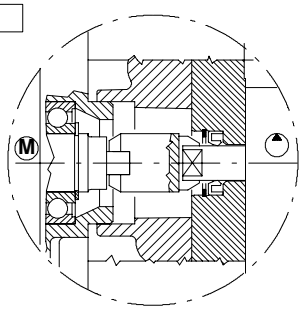
Connecting flange code: 200.6582.0019.0



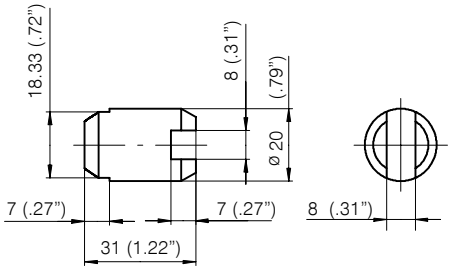


The connecting flange code doesn't include:
+ 4 screw code: 200.5216.03013 (M006x025)
+ 4 washer code: 200.5303.90611

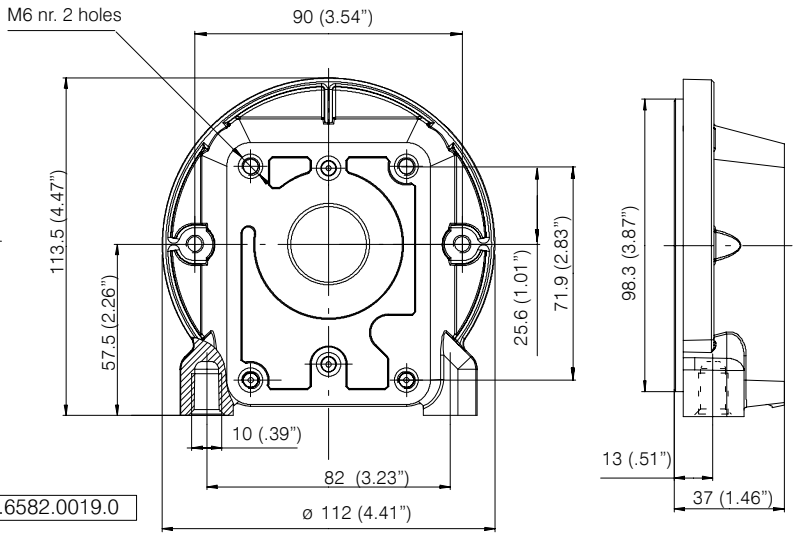
E56



The connecting flange code doesn't include:
+ 4 screw code: 200.5216.03013 (M006x025)
+ 4 washer code: 200.5303.90611



Coupling code: 200.6596.0014.0

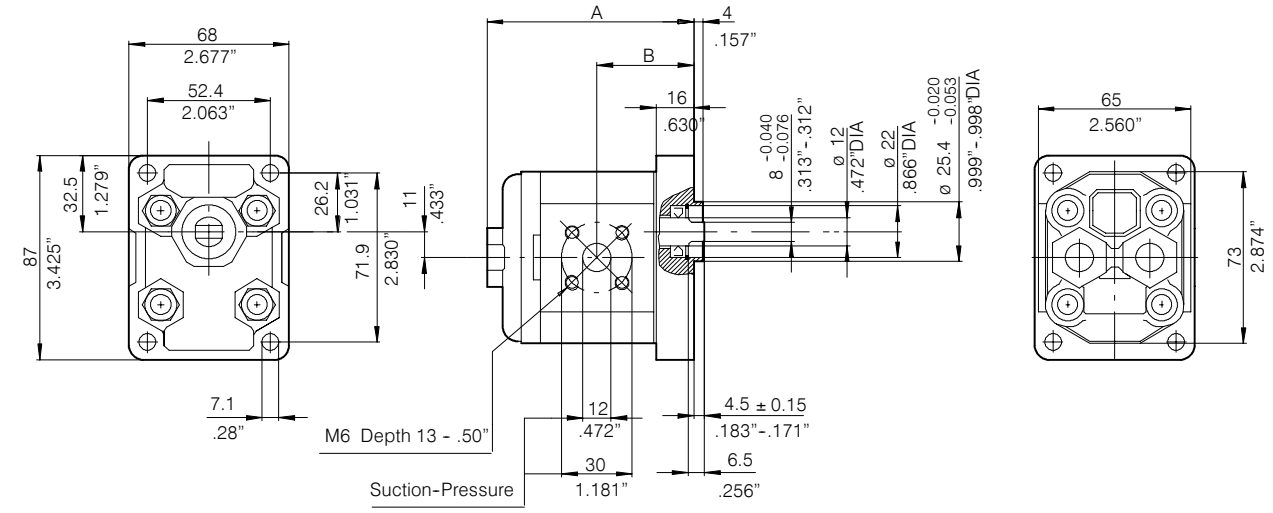


Connecting flange code: 200.6582.0019.0

12 Group 1 gear pumps

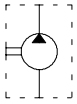
AP100	Displacement		Max. pressure						n min.		n max.	
Type	cm^3/rev	Cu. In. P. R.	P1		P2		P3		P ≤ P1	P > P1	P ≤ P1	P > P1
			bar	P.S.I.	bar	P.S.I.	bar	P.S.I.				
AP100/1.2	1.2	.073	210	3000	250	3600	280	4000	800	1000	4500	5000
AP100/1.7	1.7	.103	210	3000	250	3600	280	4000	650	800	4500	5000
AP100/2.5	2.5	.152	210	3000	250	3600	280	4000	650	800	4500	5000
AP100/3.5	3.5	.213	210	3000	230	3300	250	3600	650	800	3500	4000
AP100/4.3	4.3	.262	210	3000	230	3300	250	3600	550	700	3500	4000
AP100/5	5.0	.305	210	3000	230	3300	250	3600	500	650	3000	3500
AP100/6.5	6.5	.396	190	2700	220	3150	240	3400	500	650	2500	3000
AP100/8	7.8	.476	180	2600	210	3000	230	3300	500	650	2500	3000
AP100/10	10.0	.610	150	2150	180	2600	200	2900	500	650	2000	2500

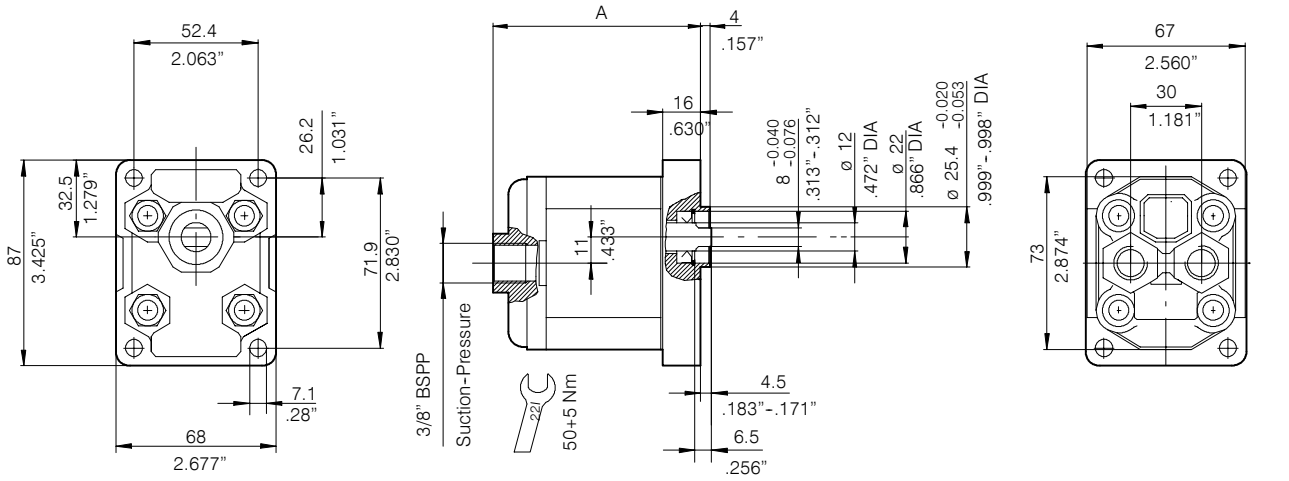
Group **AP100** Code **219**



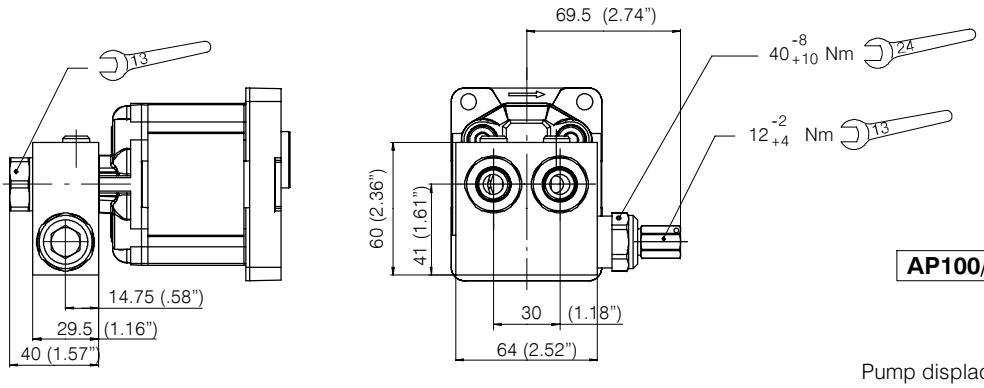
Type	Displacement cm^3/rev	Dimensions A mm	Dimensions A inches	Dimensions B mm	Dimensions B inches	Order code Counterclockwise rotation: S	
AP100/1.2	1.2	82.5	3.25	38.5	1.51	**200.1011.143.06**	S
AP100/1.7	1.7	84.5	3.33	39.5	1.55	**200.1012.143.07**	
AP100/2.5	2.5	88	3.46	41	1.61	**200.1013.143.06**	
AP100/3.5	3.5	92	3.62	43.5	1.71	**200.1014.143.06**	
AP100/4.3	4.3	96	3.78	45	1.77	**200.1015.143.06**	
AP100/5	5	98.5	3.88	46.5	1.83	**200.1016.143.04**	
AP100/6.5	6.5	103.5	4.07	49	1.93	**200.1017.143.04**	
AP100/8	7.8	109	4.29	52	2.05	**200.1018.143.02**	
AP100/10	10	118	4.64	56.5	2.22		

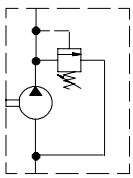
Group **AP100** Code **319**





Type	Displacement cm³/rev	Dimensions A		Order code Counterclockwise rotation: S	
		mm	inches		
AP100/1.2	1.2	82.5	3.25	**200.1011.143.07**	S
AP100/1.7	1.7	84.5	3.33	**200.1012.143.08**	
AP100/2.5	2.5	88	3.46	**200.1013.143.07**	
AP100/3.5	3.5	92	3.62	**200.1014.143.07**	
AP100/4.3	4.3	96	3.78	**200.1015.143.08**	
AP100/5	5	98.5	3.88	**200.1016.143.05**	
AP100/6.5	6.5	103.5	4.07	**200.1017.143.05**	
AP100/8	7.8	109	4.29	**200.1018.143.03**	
AP100/10	10	118	4.64		





AP100/ S319 **VMI**

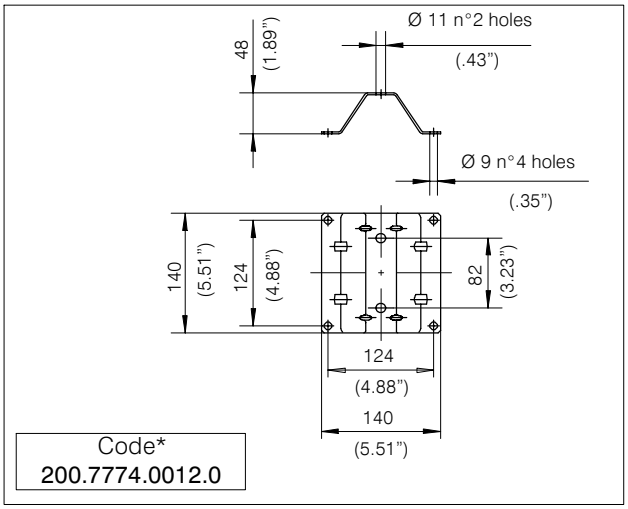
Pump displacement

Pressure setting
ex. 15= 150 bar

Spring	Spring color	Spring code	Setting range	Standard setting	Type	Relief valve code
02		200.6624.0147.0	5 - 30 bar	20 bar	**02VM01**	200.7874.0070.0
06	Yellow	200.6624.0145.0	30 - 95 bar	60 bar	**06VM01**	200.7874.0072.0
15	Green	200.6624.0148.0	95 - 210 bar	150 bar	**15VM01**	200.7874.0074.0
22	Blue	200.6624.0146.0	200 - 300 bar	220 bar	**22VM01**	200.7874.0071.0

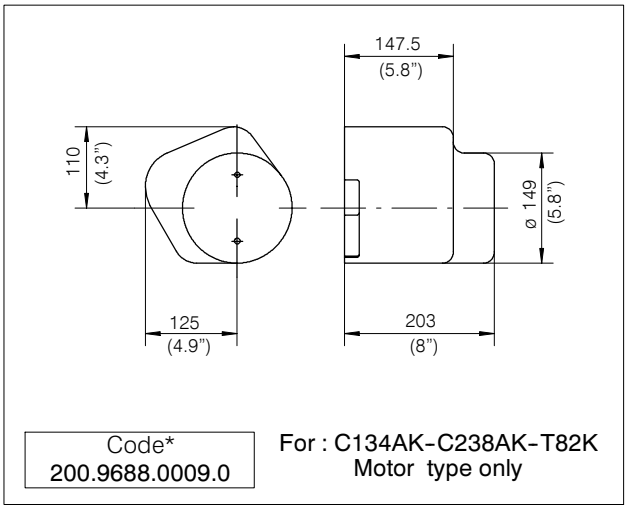
13 Components

13.1 Pressed steel bracket



Code*
200.7774.0012.0

13.2 Protective cover for D.C. motors



Code*
200.9688.0009.0

For : C134AK-C238AK-T82K
Motor type only

* Supplied with screws, washers and nuts too

14 Order designation examples of Electro-Motor-Pumps

Group 05 E. motor without relay

ET128AE/S0	-	05/0,25	S819
Electric motor		Pump displacement	pump series

Group 1 E. motor without relay

ET240AK/Y0	-	100/1,2	S219
Electric motor		Pump displacement	pump series

Group 05 E. motor with relay

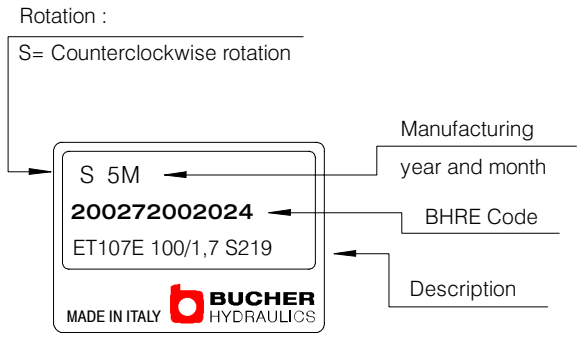
ET128AE/S0 + R106	-	05/0,25	S819
Electric motor		Pump displacement	pump series

Group 1 E. motor with relay and VMI

ET240AK/Y1	-	100/2,5	S319	12VMI
Electric motor		Pump displacement	pump series	pressure setting

Manufacturing Month	Manufacturing year			
	2004	2005	2006	2007
January	4M	5M	6M	7M
February	4N	5N	6N	7N
March	4P	5P	6P	7P
April	4Q	5Q	6Q	7Q
May	4R	5R	6R	7R
June	4S	5S	6S	7S
July	4T	5T	6T	7T
August	4U	5U	6U	7U
September	4V	5V	6V	7V
October	4Z	5Z	6Z	7Z
November	4X	5X	6X	7X
December	4Y	5Y	6Y	7Y

Product identification plate
Example



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