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The product images and drawings shown are for illustration purposes only and may not be an exact representation of the product.
We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.
Each product configuration listed below is subject to availability: please contact Sales Dpt. for more commercial detailed info.

INTRODUCTION

Read this instructions carefully before installation. All operations must be carried out by qualified personnel following the instructions.

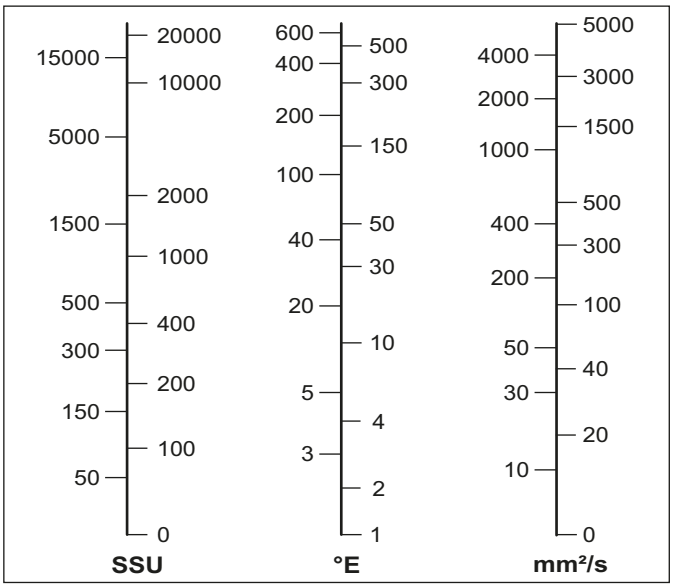
The user must periodically inspect, based on the conditions of use and the substances used, the presence of corrosion, dirt, the state of wear and correct function of the valves.

Always observe first the operating conditions given in datasheet of the valve.

HYDRAULIC FLUID

Observe the recommendations given in the data sheet of the valve. Use only mineral oil (HL, HLP) according to DIN 51524. Use of other different fluids may damage the good operation of the valve.

CONVERSION TABLE SSU / °E / mm²/s



VISCOSITY

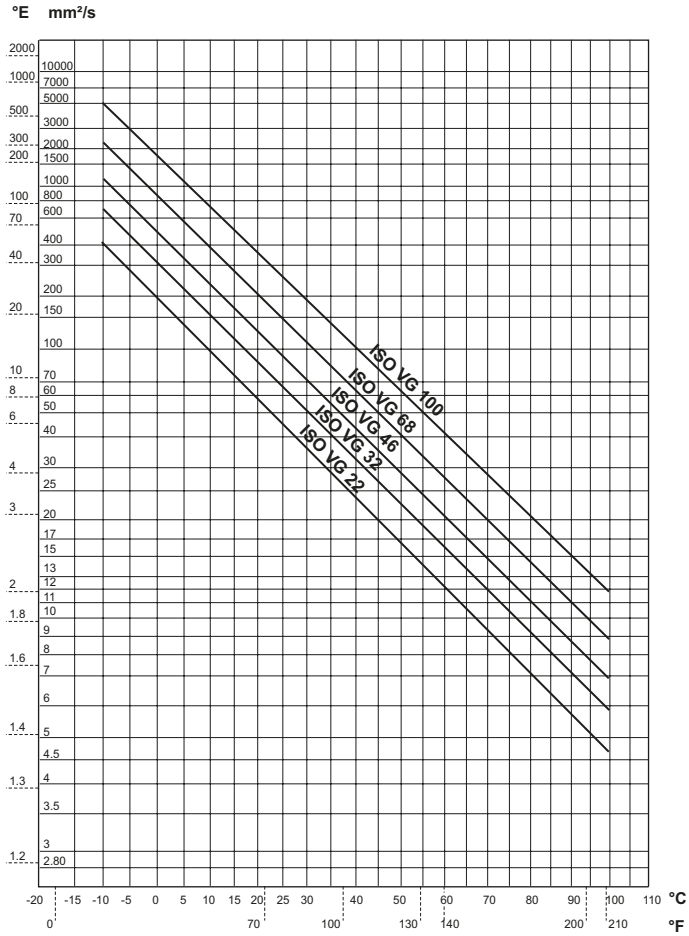
Observe the recommendations given in the data sheet of the valve.The oil viscosity must be in the range of 10 mm²/s to 500 mm²/s.
Recommended oil viscosity 46 mm²/s (32 mm²/s for Cartridge valves)

Table 1: ISO viscosity grades

Average kinematic viscosity mm²/s @ 40°C	Viscosity grade	Kinematic-viscosity limits mm²/s @ 40°C	
		min.	max.
ISO VG 10	10	9.00	11.0
ISO VG 15	15	13.5	16.5
ISO VG 22	22	19.8	24.2
ISO VG 32	32	28.8	35.2
ISO VG 46	46	41.4	50.6
ISO VG 68	68	61.2	74.8
ISO VG 100	100	90.0	110

= Values used in the chart "Oil viscosity according to temperature"

OIL VISCOSITY ACCORDING TO TEMPERATURE



CONTAMINATION

Oil contamination is the main cause of faults and malfunction in hydraulic systems. Abrasive particles in the fluid erode or block moving parts, leading to system malfunction.
The valves we are offering do not require filtering characteristics any higher than those needed for usual hydraulic components such as pumps, motors, etc.

However, accurate filtering does guarantee reliability and a long life to all the system's hydraulic parts. Reliable performance and long working life for all oil-pressure parts is assured by maintaining the level of fluid contamination within the limits specified in the data sheet of the valve.
Hydraulic fluid must also be cleaned properly before filling the hydraulic circuit, especially when commissioning a new system, as this is when the oil contamination generally peaks due to its flushing effect on the components, and the running-in of the pump.
Maximum contamination level is required on datasheet of the valve according to ISO 4406:1999.

In the following table there is the correspondence between ISO 4406:1999 and old standard NAS 1638 for information purpose:
The standard ISO 4406:1999 defines the contamination level with three numbers that relate with the number of particles of average dimension equal or greater than 4 µm, 6 µm e 14 µm, in 1 ml of fliuid.

In following table there is a reference to reccomended contamination level and correspondence with old NAS 1638 standard.

Table 2: Reccomanded contamination level.

Type of system Type of valve	Oil filtration recommendations		
	Cleanliness class recommended		Absolute filtration micron rating (**)
	ISO 4406 : 1999	NAS 1638 (*)	
Systems or components operating at HIGH PRESSURE > 250 bar (3600 psi) HIGH DUTY CYCLE APPLICATIONS Systems or components with LOW dirt tolerance	18 / 16 / 13	7 - 8	5
Systems or components operating at MEDIUM / HIGH PRESSURE Systems and components with moderate dirt tolerance	19 / 17 / 14	9	10
Systems or components operating at LOW PRESSURE < 100 bar (1500 psi) LOW DUTY CYCLE APPLICATIONS Systems and components with GOOD dirt tolerance	20 / 18 / 15	10 - 11	20

* Contamination class NAS 1638: it is determined by counting the total particles of different size ranges contained in 100 ml of fluid.

** Absolute filtration: it is a characteristic of each filter, it refers the size (in micron) of the largest sperical particle wich may pass through the filter.

WORKING TEMPERATURES

Ambient temperature range: -25°C to +60°C
Fluid temperature range (NBR seals): -25°C to +75°C
Thermal shocks can affect the performance and the expected life of the product, hence it is necessary to protect the product from these conditions.

SEALS

O-rings made in Acrylonitrile Butadiene (NBR) are normally fitted on the valves. The backup rings that protect the O-rings are also made in NBR, or sometimes PTFE. Both the O-rings and the backup rings are suitable for the working temperatures mentioned above.
In the case of fluid temperatures > 75°C, FKM seals must be used (identified with "V1" variant).

ELECTRICAL POWER SUPPLY

Solenoid valves coils are designed to operate safely in the voltage range of ±10% of nominal voltage at max. 60°C ambient temperature. The combination of permanent overvoltage and very hot temperatures can stress the solenoid. Therefore always a good heat dissipation and voltage level has to be assured.
Faulty coils may only be replaced by new, interchangeable, tested components in original-equipment quality.
Before removing a coil, voltage must be disconnected.
When replacing the coil, be aware to insert O-Rings in order to avoid the entrance of water.

INSTALLATION

The mounting surface must feature surface quality specified in data sheet of the valve: for example for Cetop valves generally is required Ra ≤ 1.6µm and flatness ≤ 0.03 mm over 100 mm length. Normally in cartridge valve for sealing diameters of the cavities, is required roughness Ra ≤ 1.6µm. The surfaces and openings in the assembly plate must be free from impurity or dirt.
Make sure the O-Rings fit correctly in their seats.
Fixing screws must comply with the dimensions and the strength class specified in the data sheet and must be tightened at the specified tightening torque.
Complete the electrical wiring. For circuit examples and pin assignments, see the relevant datasheet.

USE AND MAINTENANCE

Observe the functional limits indicated in the technical catalogue
On a periodic basis and based on the conditions of use, check for cleanliness, state of wear or fractures and correct performance of the valve.
If the O-rings are damaged, replace them with those supplied by the manufacturer.
To assure the best working conditions at all time, check the oil and replace it periodically (after the first 100 working hours and then after every 2000 working hours or at least once every year).
Attention: all installation and maintenance intervention must be performed by qualified staff.

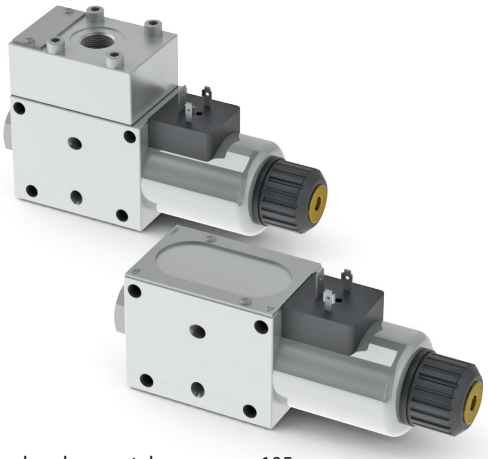
TRANSPORT AND STORAGE

The valve must be handled with care to avoid damage caused by impact, which could compromise its efficiency.
In the case of storage, keep the valves in a dry place and protect against dust and corrosive substances.
When storing for periods of more than 6 months, fill the valve with preserving oils and seal it.

CONVERSION CHART

Type	SI units		Alternative units		Conversion factor
Force	Newton	(N) [kgm/s^2]	Kilogram force	(kgf)	1 kgf = 9.807 N
			pound force	(lbf) [lbf/s^2]	1 lgf = 4.448 N
Length	millimeter	(mm) [10 m]	inch	(in)	1 in = 25.4 mm
	meter	(km) [1000 m]	yard	(yd) [3ft]	1 m = 1.0936 yd
	kilometer	(km) [1000 m]	mile	(mile) [1760 yd]	1 mile = 1.609 km
Torque	Newton meter	(Nm)	pound force.feet	(lbf.ft)	1 lbf.ft = 1.356 Nm
Power	kiloWatt (kW)	[1000 Nm/s]	horsepower	(hp)	1 kW = 1.341 hp
			metric horsepower	(CV)	1 kW = 1.36 CV
Pressure	MegaPascal	(MPa) [N/mm^2]	bar		1 MPa = 10 bar
			psi (lbf/ln^2)		1 MPa = 145 psi
			ton/f/ln^2		1 ton/f/ln^2 = 15.45 MPa
Flow rate	liter/min	(l/min)	UK gal/min		1 UK gal/min = 4.546 l/min
			US gal/min		1 US gal/min = 3.785 l/min
Temperature	Degrees Celsius	(°C)	Farenheit	(°F)	1°F = 1.8 °C+32

OPEN LOOP PROPORTIONAL PRESSURE COMPENSATED BANKABLE FLOW REGULATORS



Connector to be ordered separately, see page 105.

Open loop proportional flow regulator 3 way compensated with priority function.

- Regulate the flow in proportion to an applied electrical current (REM, MAV or CEPS power amplifier).
- Flow regulation is independent both from load – POUT port – and pump flow variations. Load compensation is achieved by a spool compensator, which holds the pressure drop constant across the proportional spool.
- Emergency control.
- Coils protection IP66
- Standard connectors DIN 43650 ISO 4400, AMP Junior, and Deutsch
- Regulated flow rate 15 / 20 l/min
- Cast iron zinc plated body.

ORDERING CODE

CXQ	Open loop 3 way proportional compensated flow regulator for module units and bankable valves
3	Size
C	3 way compensation
*	P = 3 way (external excedence Line/ priority function) T = 3 way (internal excedence to T)
*	Nominal flow rates H = 15 l/min I = 25 l/min
D	With decompression
*	Max. current at solenoid (1): E = 2.35 A - Special coil (9 VDC) F = 1.76 A (12 VDC) G = 0.88 A (24 VDC)
**	Variants (1-2): S1 = No variant L7 = emergency lever (3) P2 = Rotary emergency (3) R5 = Rotary emergency 180° (3) AJ = Coil with AMP Junior connection (1) CZ = Coil with Deutsch connection DT04-2P (1)
2	Serial No.

(1) Coils technical data, see page 111.
Voltage codes are not stamped on the plate, their are readable on the coils
(2) Connector to be ordered separately, see page 105;
(3) Emergency (see page 46)

FEATURES

Max. operating pressure ports P_{in} / P_{out} / E	250 bar
Max. operating pressure ports T (Pressure dynamic allowed for 2 millions of cycles)	250 bar
Regulated flow rate	15 / 25 l/min
Decompression drain flow	max 0.7 l/min
Relative duty cycle	Continuous 100% ED
Type of protection (Hirschmann coil)	IP 66
Flow rate gain	See diagram "Input signal flow"
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-20°C ÷ 75° C
Ambient temperature	-20°C ÷ 60°C
Max. contamination level (filter $ß_{10} \geq 75$)	ISO4406:1999: class 19/17/14 NAS 1638: class 8
Weight version CXQ3CP.. Weight version CXQ3CT..	2.25 kg 1.75 kg

Solenoid	@ 9Vdc	@ 12Vdc	@ 24Vdc
Current supply	PWM(pulsewidthmodulation)		
Max. current solenoid	2.35 A	1.76 A	0.88 A
Solenoid coil resistance at 25°C (77°F)	2.25Ohm	4.0 Ohm	16.0Ohm
PWM or superimposed dither frequency	100 ÷ 150 Hz		

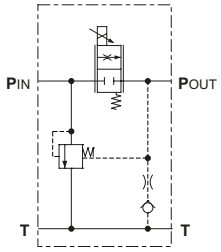
Operating specifications are valid for fluid with 46 mm^2/s viscosity at 40°C, using the specified Dana electronic control units.

Accessories

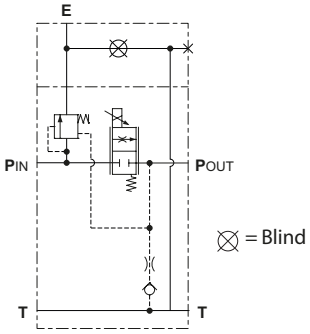
REMSRA..	Card type control for single solenoid
CEPS...	Electronic amplifier plug version for signle solenoid
MAV	Electronic module for integrate control of proportional valves and ON/OFF
JMPEI0M700101	Joystick with standard handle
JMPIU0M700138	Joystick Person present handle

HYDRAULIC SYMBOLS

CXQ3CT..

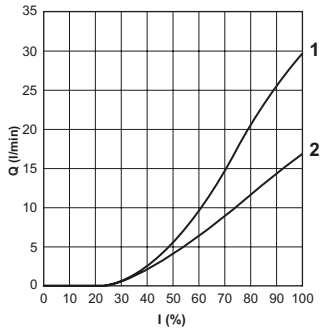


CXQ3CP..

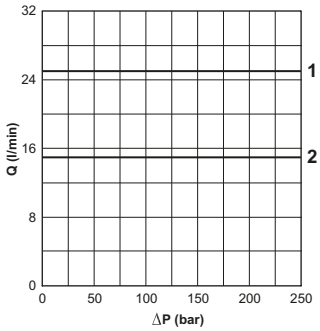


DIAGRAMS

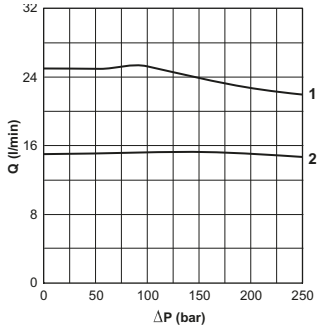
INPUT SIGNAL
FLOW



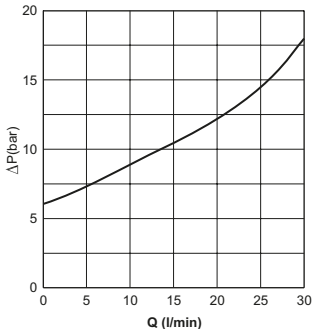
FLOW RATE BACK PRESSURE
ON PRIORITY LINE



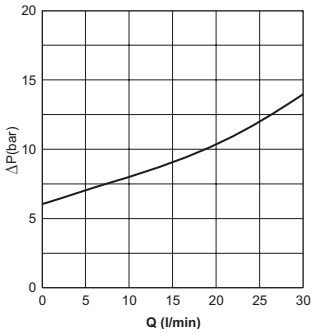
FLOW RATE BACK PRESSURE
ON SECONDARY LINE



ΔP PUMP FLOW PIN → T
CXQ3CT ...



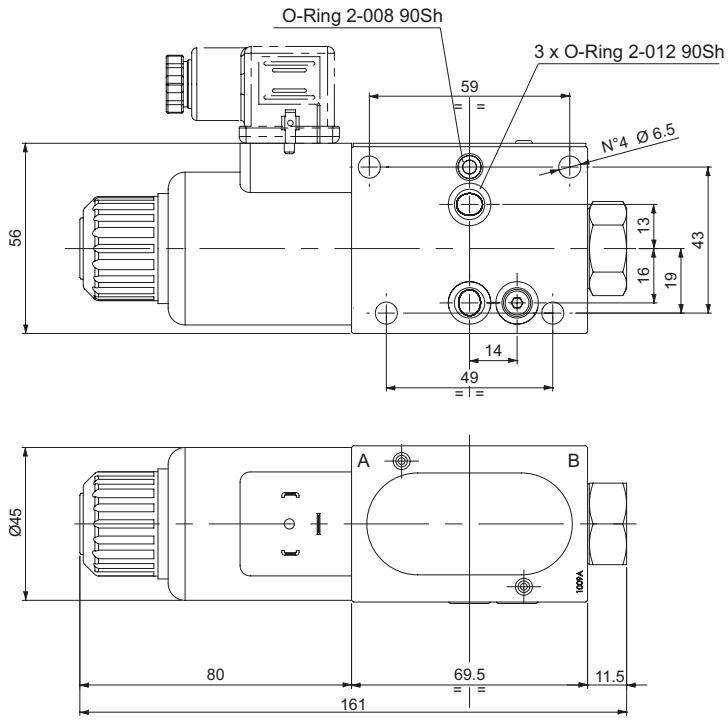
ΔP PUMP FLOW PIN → T
CXQ3CP ...



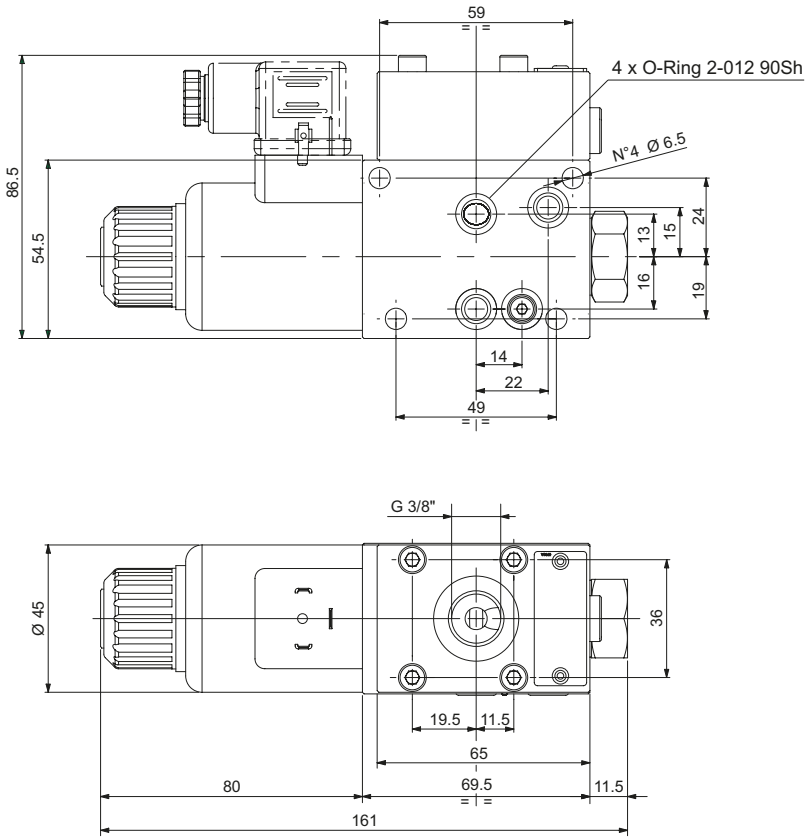
1= CXQ3C*I...
2= CXQ3C*H..

The fluid used is a mineral based oil with a viscosity of 46 mm²/s at 40°C. The tests have been carried out at with a fluid of a 40°C.

OVERALL DIMENSIONS CXQ3CT ...

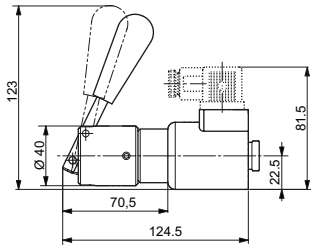


OVERALL DIMENSIONS CXQ3CP ...

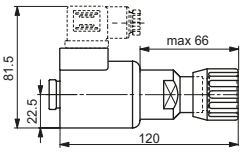


VARIANTS

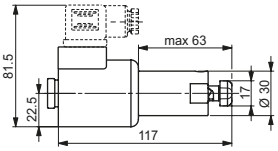
"L7"
Emergency lever



"P2"
Rotary emergency



"R5"
Rotary emergency
180°

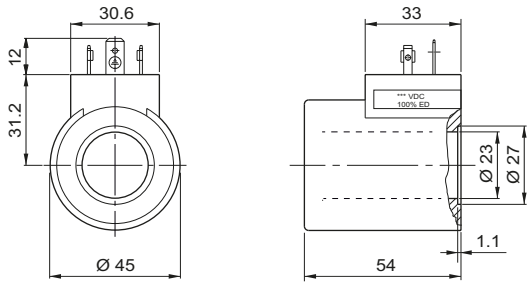


Emergency P2 and P5, tightening torque max. 6÷9 Nm (CH n. 22)

D15P COILS - (FOR PROPORTIONAL VALVES)

Type of protection	IP 66
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C

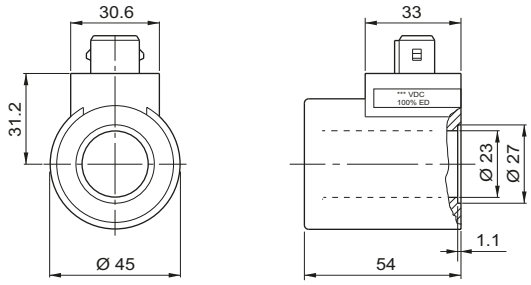
Duty cycle	100% ED
Insulation class wire	H
Weight	0.354 kg



STANDARD Hirschmann ISO 4400 DIN43650

Coil		Max winding temperature (1)	Current	Resistance ±7% (2)	Spare code
Code	Voltage				
E	9 VDC	125 °C	2.35 A	2.25 Ω	M14230101
F	12 VDC	125 °C	1.76 A	4 Ω	M14230102
G	24 VDC	125 °C	0.88 A	16 Ω	M14230103

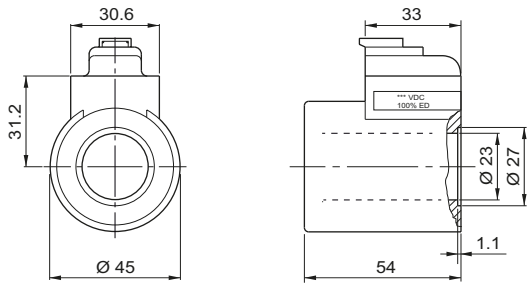
(1) Ambient temperature 25 °C - (2) Ambient temperature 20 °C



AMP Junior (AJ variant)

Coil		Max winding temperature (1)	Current	Resistance ±7% (2)	Spare code
Code	Voltage				
E	9 VDC	125 °C	2.35 A	2.25 Ω	M14770001
F	12 VDC	125 °C	1.76 A	4 Ω	M14770002
G	24 VDC	125 °C	0.88 A	16 Ω	M14770003

(1) Ambient temperature 25 °C - (2) Ambient temperature 20 °C



DEUTSCH DT04-2P (CZ variant)

Coil		Max winding temperature (1)	Current	Resistance ±7% (2)	Spare code
Code	Voltage				
E	9 VDC	125 °C	2.35 A	2.25 Ω	M14590001
F	12 VDC	125 °C	1.76 A	4 Ω	M14590002
G	24 VDC	125 °C	0.88 A	16 Ω	M14590004

(1) Ambient temperature 25 °C - (2) Ambient temperature 20 °C