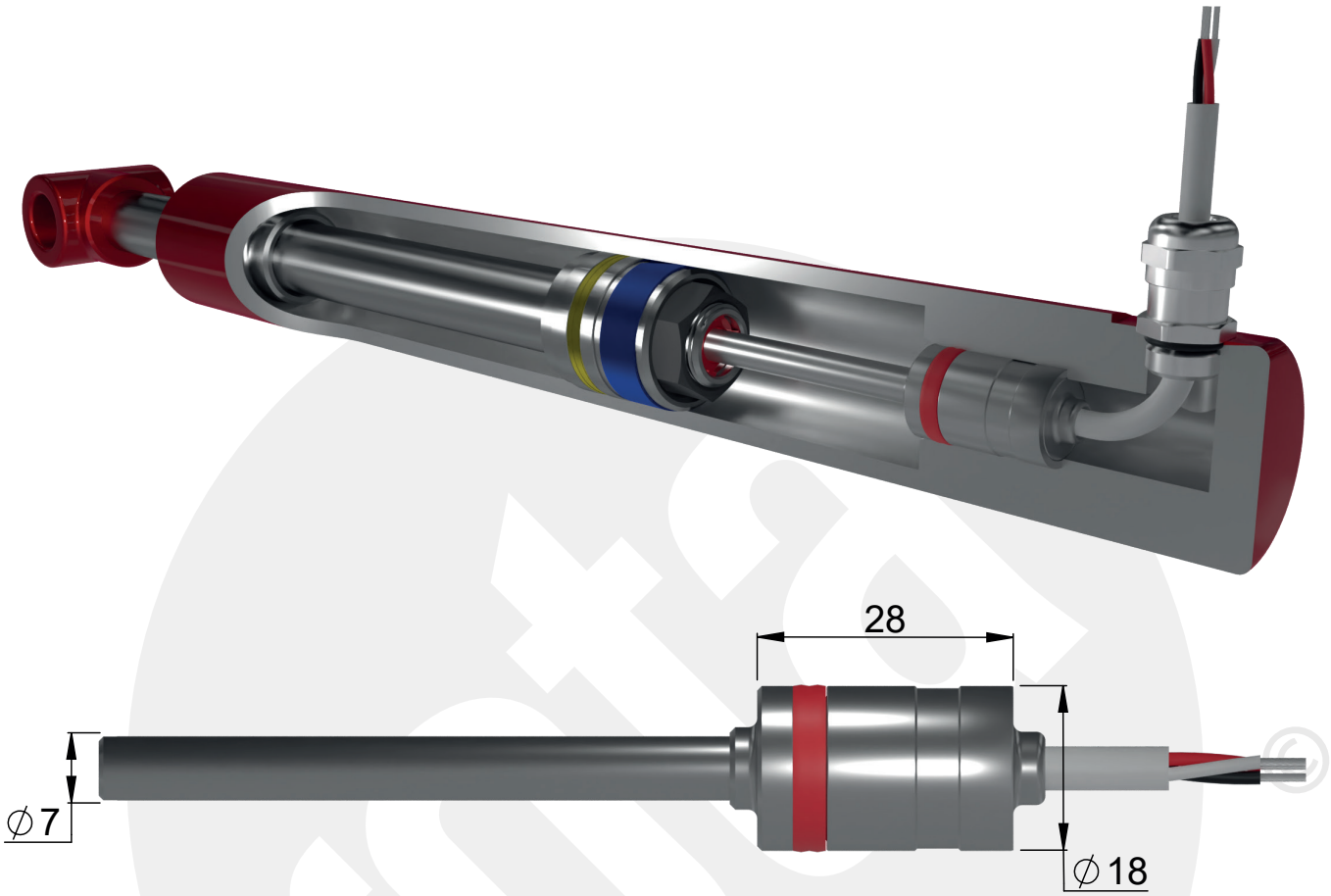
NM SERIES LINEAR TRANSDUCER DATA SHEET

Narrow-Diameter Internally-Mounted Linear Transducers for Small-Diameter Cylinders



BENEFITS

- Rota's narrowest sensor designs, suitable for some ≥Ø16 mm piston rods
- Ø7 mm sensor rod reduces gundrill hole diameter
- Small-diameter mounting head options
- Multiple electrical termination options
- IP69K un-mated connector options

PERFORMANCE

- Absolute signal output
- 0.3 mm resolution
- -40 to +105°C operating pressure
- Up to 735 mm stroke
- Solid-state, zero wear
- High vibration ratings and EMC ratings expected

ENCLOSURE

- Welded stainless steel as standard
- Ø7 mm tube
- 470 bar working pressure rating

OUTPUTS

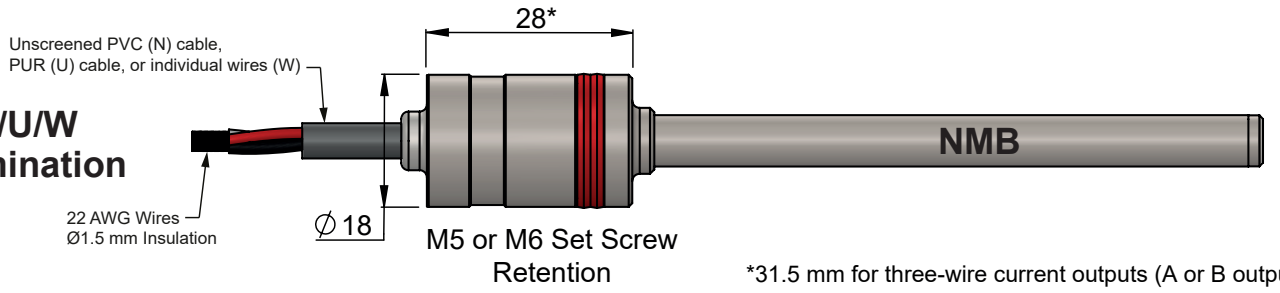
- Analogue Voltage/Current/PWM options
- CANbus SAE J1939, CANopen and ISOBUS
- CANbus with Temperature indication option

TERMINATION

- Deutsch DT & DTM with Rota un-mated IP69K pins
- Integrated or cable-mounted M12
- AMP

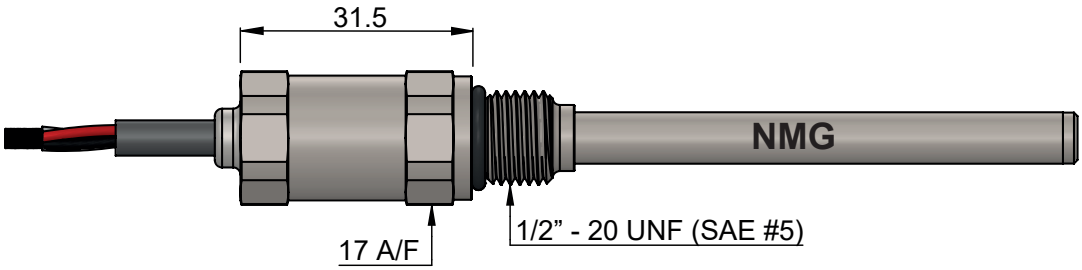
MOUNTING CONFIGURATIONS AND TERMINATION OPTIONS

N/U/W Termination

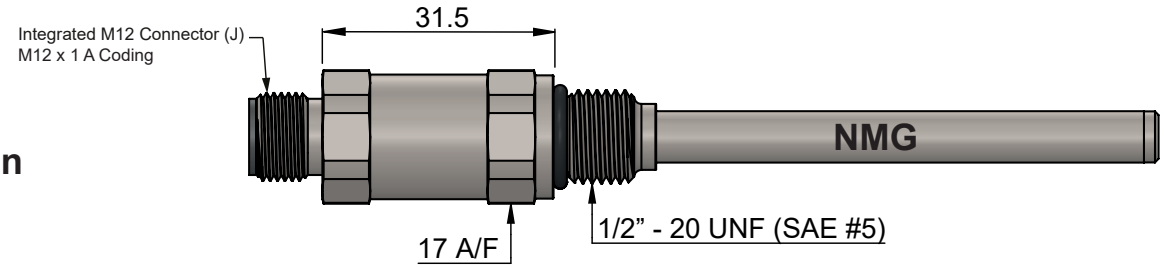


*31.5 mm for three-wire current outputs (A or B outputs)

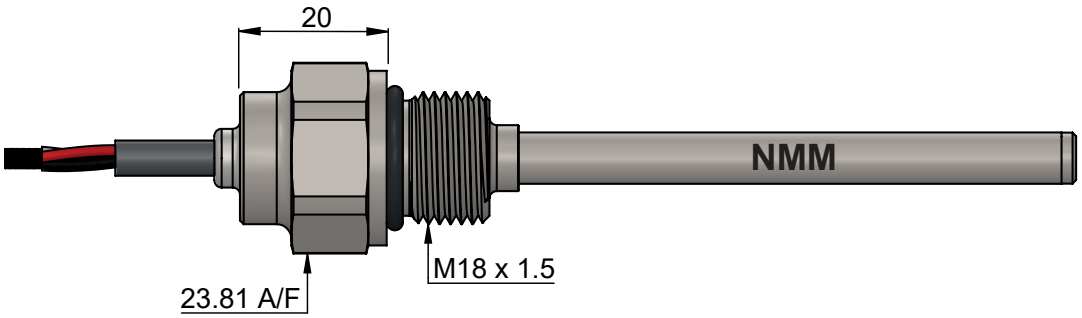
N/U/W Termination



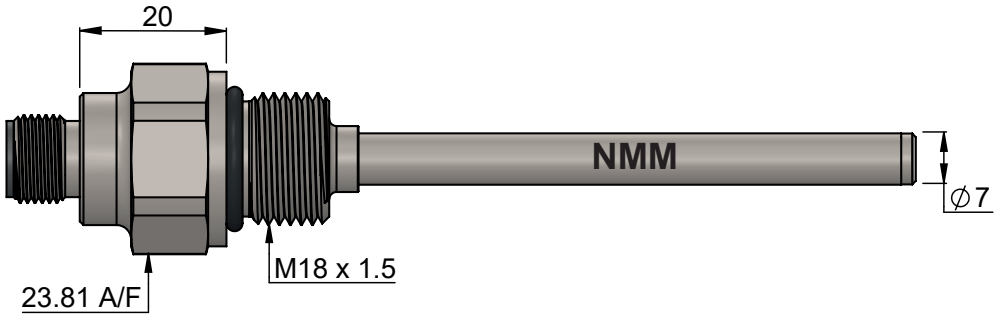
J Termination



N/U/W Termination



J Termination



Subject to reasonable modifications due to technical advances

CABLE-MOUNTED PLASTIC CONNECTORS

Thread-mounted transducers are available with complete male connector pre-fitted. Others are supplied with pins only pre-fitted, or with all connector parts loose. See mounting options for details. The connectors can be paired with either the PVC (N) or PUR (U) cable.

Connector Model Rota pins for DT	Rota Order Code*	Connector Model Rota pins for DTM	Rota Order Code*	Connector Model AMP Superseal	Rota Order Code*	Connector Model M12	Rota Order Code
DT04 2 pin	2RT	DTM04 2 pin	2RM	282104-1	2UP	M12 4 pin	4MH
DT04 3 pin	3RT	DTM04 3 pin	3RM	282105-1	3UP	M12 5 pin	5MH
DT04 4 pin	4RT	DTM04 4 pin	4RM	282106-1	4UP	M12 90° 4 pin	4M9
DT04 6 pin	6RT	DTM04 6 pin	6RM	282107-1	5UP	M12 90° 5 pin	5M9
DT04 8 pin	8RT	DTM04 8 pin	8RM	282108-1	6UP		

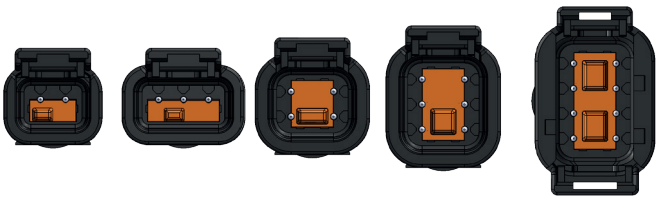
* For pre-fitted pins/contacts only (no connector body), replace the last letter of the Rota order code with 'C', eg '3RT' becomes '3RC', '4UP' becomes '4UC' etc.

Rota/Deutsch RT - Superior Sealing **

Deutsch connector with Rota machined male pins
IP69k unmated (Steam Jet Clean 99°C at 150 Bar)
Enables transducer's Deutsch connector to be left safely unmated

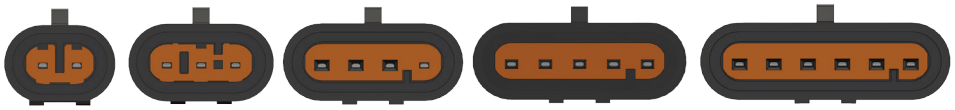
Rota/Deutsch DRM - Series **

Minature Rota pins for smaller wire gauge applications
Operating Temperature:
-55°C to +125°C
IP68 rated when mated



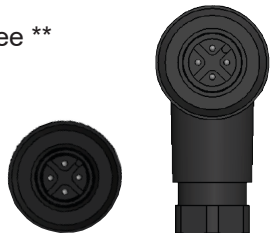
AMP Superseal 1.5 - Series **

Operating Temperature:
-40°C to +125°C
IP67 rated when mated



M12 Connector - Straight or 90 Degree **

With screw terminals
M12 A connector male pins
Operating Temperature:
-40°C to +85°C
IP67 rated when mated



Extended clevis shows cable-mounted connector.
Installed to be easily removable.

**NMB transducers supplied with loose heatshrink and connector body for customer assembly as connector body cannot fit through end cap. For Deutsch/AMP connectors, pins will be fitted to cable.

Subject to reasonable modifications due to technical advances

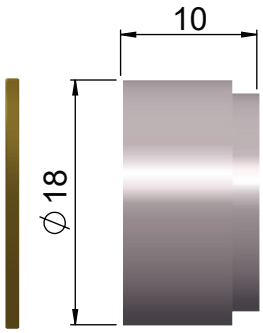
MAGNET OPTIONS

Internal magnets must be housed in magnetic material. For housing in non-magnetic material please contact Rota. For machining details please see page 6.

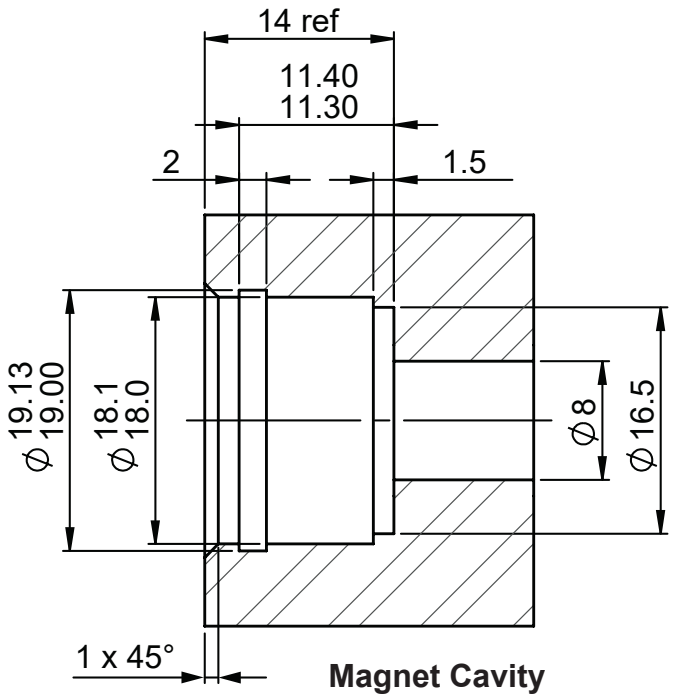
Circlip Design

0.3 mm Resolution, <±1.0 mm Non-linearity

‘M’ Magnet (Rota P/N 255194)



Fitted with a special non-magnetic circlip, supplied by Rota, must be fitted with care.
Supplied circlip must be fitted.



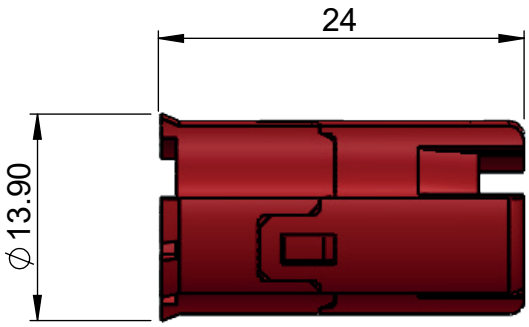
Magnet Cavity Machining Details

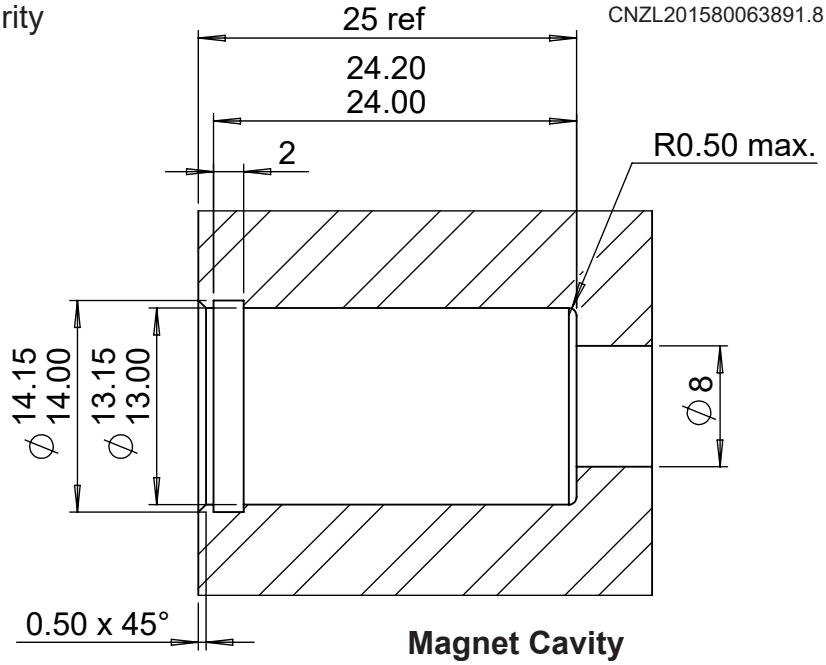
Clip-In Design

0.3 mm Resolution, <±0.6 mm Non-linearity

Patented:
US 10,222,238 / EP 3198231
KR10-1960719 / JP 6713457
CNZL201580063891.8

‘PV’ Magnet (Rota P/N NM 1239)



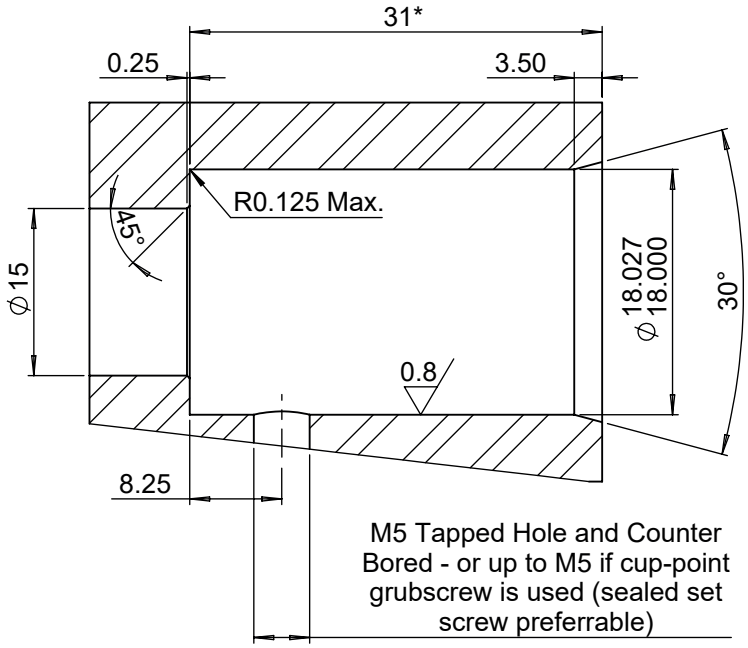


Magnet Cavity Machining Details

Subject to reasonable modifications due to technical advances

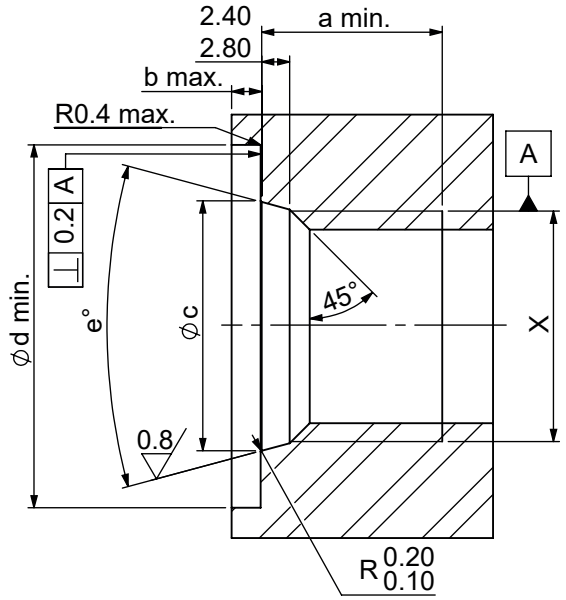
END CAP MACHINING DETAILS

NMB HEAD CAVITY



*34.5 mm for three-wire current outputs (A or B)

NMG/NMM HEAD CAVITY



	X	a	b	c	d	e	Tightening Torque into Steel End Cap	
							N·m	lbf·ft
NMG	1/2” - 20 UNF (SAE #5)	12	1.6	14.00/14.13	19	24	30	22.13
NMM	M18 x 1.5 6H	15	2.0	19.8/19.9	30	30	35	25.81

ADVANCED FEATURES AND HOW TO ORDER

20G RMS VIBRATION RESISTANCE INCLUDING RESONANT FREQUENCIES

To assure an extended life for our products, Rota is one of only a few companies that exceed standard requirements during vibration testing. In particular, Rota sensors are tested at 20g (RMS) from 10-2000Hz (including resonant frequencies) and additionally held at 1g for one hour at resonant frequencies.

Rota's NM transducers will meet and exceed the compliance requirements of the following IEC standards:

- IEC 60068-2-64 (Vibration, Broadband Random & Guidance) at 20g 10-2000Hz (RMS) in all 3 axes
- IEC 60068-2-6 (Vibration, Sinusoidal) at 20g 10-2000Hz in all 3 axes
- IEC 60068-2-27 (Shock) Total of 100 shocks at 100g over all 3 axes
- Resonant Frequency Search and Dwell Test - 10-2000Hz up to 7 found and each held @1g for 1 Hour

OUTSTANDING EMC PERFORMANCE

Rota NM transducers are designed to meet some of the highest EMC standards worldwide, enabling safe and secure operation in electromagnetic environments whilst ensuring superior and reliable performance. All Rota NM sensors will meet and exceed the compliance requirements in the standards listed below.

- UN ECE Reg. 10.05: October 2014 (AUTOMOTIVE)
- EN ISO 14982:2009 (AGRICULTURAL AND FORESTRY MACHINERY)
- ISO 13766:2018 (EARTH-MOVING AND BUILDING CONSTRUCTION MACHINERY)

E11 10 R

NM	B	0500	PV	0.3	A	R	-	9	-	-	1234

NM Series Linear Transducer

Mounting Configuration
B = M3-M5 Grubscrew
G = 1/2" - 20 UNF (SAE #5)
M = M18 x 1.5

Stroke (mm)

Magnet*
M = 0.3 mm res., circlip mount
PV = 0.3 mm res., clip-in mount

Signal Resolution
0.3 mm

Output Signal

A	= Current 4 to 20 mA (3 Wire)	(13 to 32 V Input)
B	= Current 4 to 20 mA (3 Wire)	(10 to 18 V Input)
C	= Voltage 0.5 to 3.5 V	(4 to 10 V Input)
F	= Voltage 0.25 to 4.75 V	(9 to 32 V Input)
G	= Voltage 0.5 to 4.5 V	(9 to 32 V Input)
H	= Voltage 0.5 to 10.0 V	(13 to 32 V Input)
J	= CANbus SAE J1939	(9 to 32 V Input)
L	= Voltage 0.5 to 4.5 V	(5 to 10 V Input)
O	= CANopen	(9 to 32 V Input)
P	= P.W.M 500 Hz	(9 to 32 V Input)
R	= Voltage 0.5 to 4.75 V	(9 to 32 V Input)
T	= Current 4 to 20 mA (2 Wire)	(11 to 28 V Input)
V	= Voltage 0.5 to 5.0 V	(9 to 32 V Input)
Z	= ISOBUS	(9 to 32 V Input)

Optional
R = Reversible signal

Optional
L = 'End of stroke' signal positions factory set at Rota
Q = Quick calibration

Optional Connectors
J = Integrated 90° M12 Connector (no cable)
2RT = Deutsch DT04-2P with Rota contacts
3RT = Deutsch DT04-3P with Rota contacts
4RT = Deutsch DT04-4P with Rota contacts
6RT = Deutsch DT04-6P with Rota contacts
2RM = Deutsch DTM04-2P with Rota contacts
3RM = Deutsch DTM04-3P with Rota contacts
4RM = Deutsch DTM04-4P with Rota contacts
6RM = Deutsch DTM04-6P with Rota contacts
4MH = M12 - 4 pin
5MH = M12 - 5 pin

Cable Type
N = PVC Cable
U = PUR Cable

Cable Length (m)
Standard lengths:
0.15, 0.3, 0.5, 1.0, 1.5, 2.0

Unique Transducer Calibration Number