

Motor units MTR-DCI, intelligent servo motors



- 1 - Type discontinued
Available up until 2018

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Key features

General information

The motor unit MTR-DCI is an innovative motor with integrated power electronics for positioning tasks.

Four components in one housing

Integrated in the MTR-DCI are the motor, gear unit, controller and power electronics. This means that there is no need for a control cabinet or extensive cabling.

Reliable

The integrated power electronics and controller removes the need for motor cables and improves the electromagnetic compatibility. Additional monitoring functions are integrated.

Uncomplicated

The complete commissioning process can be performed directly on the MTR-DCI via the optional LCD display or on a PC via the user-friendly menus in the FCT (Festo Configuration Tool). No matter which approach is used, all parameters are continuously controlled.

At a glance

- Compact design
- Smooth profile prevents the ingress of dirt
- DC motor with planetary gear unit and encoder
- Gear unit ratio:
7:1; 14:1
- Protection class IP54

Positioning functionality

- 16 traversing records (including homing)
- Constant acceleration and braking
- Positioning control

Protective functions

- Temperature monitoring
- Current monitoring
- Voltage failure detection
- Following error monitoring
- Software end-position detection

Easy actuation via

- I/O interface
- Profibus
- CANopen
- DeviceNet

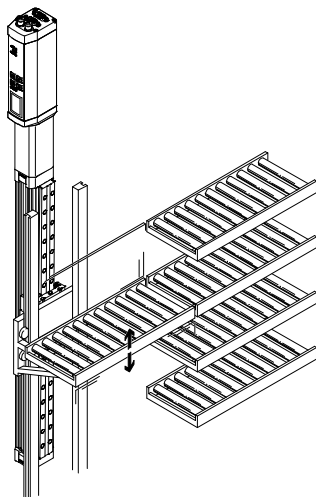


- 1 Control panel with integrated display (optional)
- 2 Input for reference limit switches
- 3 RS232 interface
- 4 Operator interface: I/O interface
- 5 Power supply
- 6 Gear unit

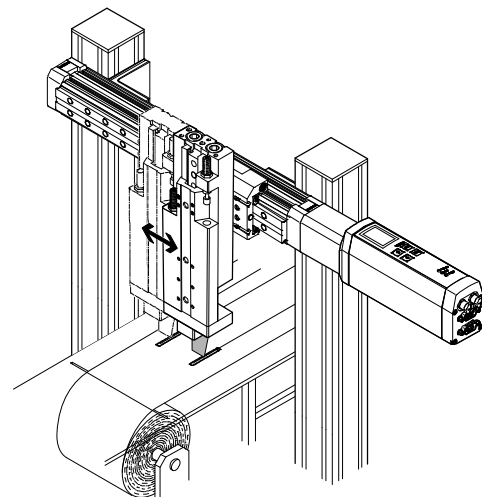


Typical applications

Adjusting sorting conveyors



Programming formats for paper or foil cutting machines



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Type codes

		MTR	-	DCI	-	42	S	-	VC	SC	-	E	G7	-	H2	IO	
Type																	
MTR	Motor																
Motor type																	
Size																	
Torque class																	
S	Standard																
Nominal voltage																	
VC	24 V DC																
Plug design																	
SC	Straight plug outlet																
Measuring system																	
E	Encoder																
Gear unit ratio																	
G7	7:1																
G14	14:1																
Parameterisation interface																	
R2	RS232																
H2	RS232 and control panel																
Electrical connection technology																	
IO	I/O interface																
CO	CANopen interface																
PB	Profibus interface																
DN	DeviceNet interface																

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Technical data

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Size
32 ... 52 mm

Voltage
24 V DC

Fieldbus interfaces

PROFI
BUS

CANopen

DeviceNet



General technical data			
Size	32	42	52
Rotary position generator	Incremental encoder		
Rotary position encoder measuring principle	Optical		
No. of increments/revolution	300 (1200) ¹⁾	500 (2000) ¹⁾	
Controller operating mode	PWM MOSFET power amplifier		
Display resolution	128 x 64 pixels		
Type of mounting	Can be bolted on or clamped to gearing unit flange		
Gearing unit type	Planetary gearing		
Gear unit ratio	G7	6.75 (7:1); 1-stage	
	G14	13.73 (14:1); 2-stage	

1) Internal 4-fold evaluation

Electrical data – Motor			
Size	32	42	52
Nominal voltage [V DC]	24 ±10%		
Nominal current (motor) [A]	0.73	2	5
Peak current [A]	2.1	3.8	7.7
Motor constant [Ncm/A]	4.5	6.1	6.4
Nominal power (motor) [W]	17	48	122
Max. current (digital logic outputs) [mA]	200		60
Parameterisation interface	RS232; 9600 baud		

Mechanical data – Motor						
Size	32		42		52	
Gear unit ratio	G7	G14	G7	G14	G7	G14
Gearing unit output speed [rpm]	481	237	444	218	444	218
Gearing unit torsional backlash [°]	≤ 1.9	≤ 1.55	≤ 1.3	≤ 0.95	≤ 1.1	≤ 0.75
Gearing unit output torque [Nm]	0.15	0.29	0.59	1.13	1.62	3.08
Gearing unit efficiency	0.75	0.7	0.8	0.75	0.8	0.75
Mass moment of inertia (rotor) [kg cm ²]	0.024		0.323		1.209	
Mass moment of inertia (gearing unit) [kg cm ²]	0.00089	0.00149	0.00235	0.00441	0.01132	0.01711
Radial shaft load [N]	40	70	160	230	200	320
Axial shaft load [N]	10	20	50	80	60	100
Product weight [kg]	0.72	0.74	1.72	1.83	3.1	3.3

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Technical data

Operating and environmental conditions			
Size	32	42	52
Digital logic outputs	Not electrically isolated		Electrically isolated
Insulation protection class to VDE 60034	F		
Protection class	IP54		
Protective functions	I ² T monitoring		
	Following error monitoring		
	Software end position detection		
	Voltage failure detection		
	Current monitoring		
	Temperature monitoring: Silicon absolute temperature sensor, switches off at temperatures >70 °C		
Ambient temperature [°C]	0 ... +50		
Storage temperature [°C]	-25 ... +60		
Relative air humidity [%]	0 ... 95 (non-condensing)		
CE mark (see declaration of conformity)	In accordance with EU EMC directive		
Certification	C-Tick		
Note on materials	Contains paint wetting impairment substances		

Materials	
Motor unit housing	Anodised aluminium
Motor unit cover	Aluminium, precision casting, coated

Technical data – I/O/fieldbus interface				
Type	MTR-DCI-...-IO	MTR-DCI-...-CO	MTR-DCI-...-PB	MTR-DCI-...-DN
Interface	I/O interface for 15 traversing records and homing	CANopen	Profibus DP	DeviceNet
Number of digital logic inputs	6	–	–	–
Number of digital logic outputs	2	–	–	–
Max. current of digital logic outputs (size)	32/42	200	–	–
	52	60	–	–
Bus terminating resistor ¹⁾	–	Not integrated in the device	Not integrated in the device	Not integrated in the device
Communication profile	–	DS301 / FHPP	DP-V0/V1 / FHPP	FHPP
	–	DS301; DSP402	Step7 functional modules	Device type 0C _h
Max. fieldbus baud rate [kbps]	–	1000	12000	500

1) Details of bus terminating resistor → 10

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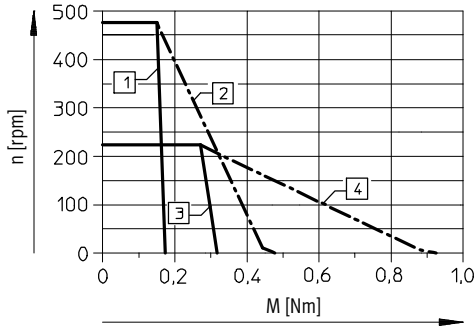
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Technical data

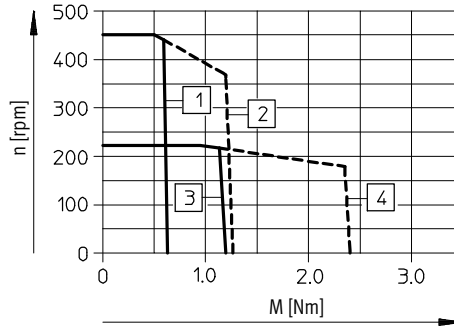
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Torque M as a function of rotational speed n

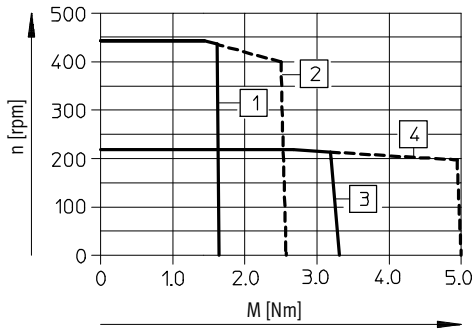
Size 32



Size 42



Size 52



Gear unit ratio 7:1

- 1 Torque, nom.
- 2 Torque, max.

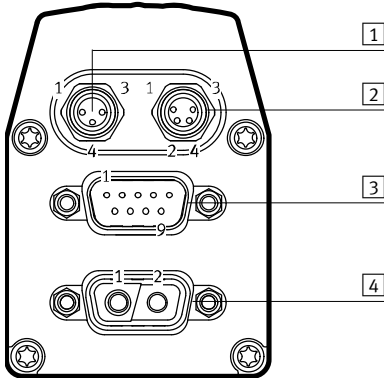
Gear unit ratio 14:1

- 3 Torque, nom.
- 4 Torque, max.

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Technical data

Pin allocation



1 Reference switch, 3-pin M8 socket

Pin	Function
1	24 V
4	Reference input
3	0 V
-	

2 RS 232 interface, 4-pin M8 socket

Pin	Function
1	0 V
2	Transmitted data (TxD)
3	Received data (RxD)
4	-

3 I/O interface, 9-pin Sub-D plug

Pin	Function
1	Traversing record coding, bit 0
2	Traversing record coding, bit 1
3	Traversing record coding, bit 2
4	Traversing record coding, bit 3
5	Start bit
6	Enable bit
7	Ready signal output
8	MC signal output
9	0 V

3 CANopen interface, 9-pin Sub-D plug

Pin	Function
1	-
2	CAN_L
3	CAN_GND
4	-
5	CAN_SHLD
6	CAN_V-
7	CAN_H
8	-
9	CAN_V+

3 Profibus interface, 9-pin Sub-D socket


Pin	Function
1	-
2	Logic_GND
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	Logic_V (24 V DC)
8	RxD/TxD-N
9	-

3 DeviceNet interface, 9-pin Sub-D plug

Pin	Function
1	-
2	CAN_L
3	CAN_GND
4	-
5	CAN_SHLD
6	CAN_V-
7	CAN_H
8	-
9	CAN_V+

4 Power supply, 2-pin plug

Pin	Function
1	24 V DC
2	0 V
-	
-	
-	
-	
-	
-	
-	

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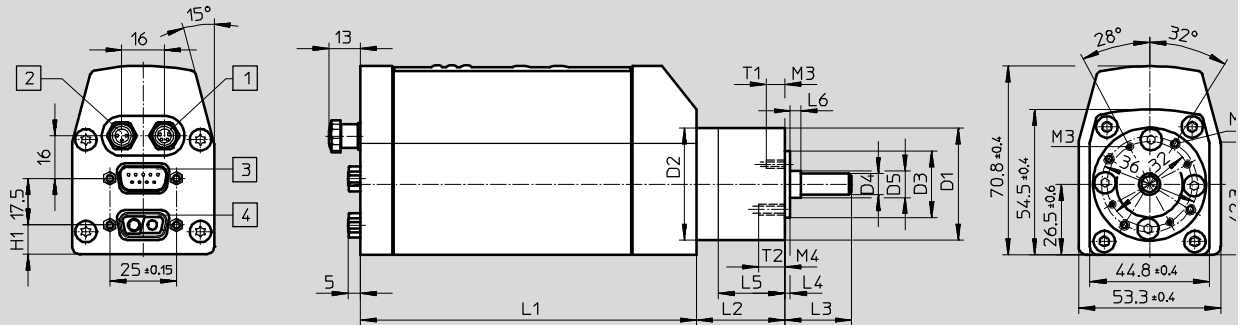
Technical data

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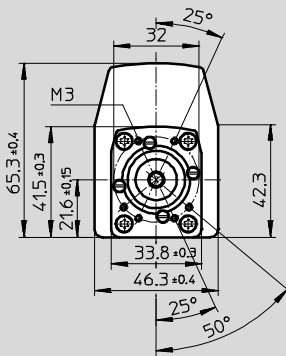
Dimensions

Download CAD data → www.festo.com

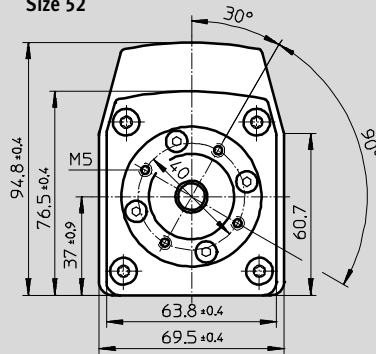
Size 42



Size 32



Size 52



- 1 M8x1, 4-pin
- 2 M8x1, 3-pin

- 3 Sub-D, 9-pin
- 4 Sub-D, 2-pin

Type	D1 ∅ g10	D2 ∅ ±0.1	D3 ∅ h8	D4 ∅ h7	H1	L1 ±1	L2 ±1	L3	L4	L5	T1	T2 +2
MTR-DCI-32S-...-G7	-	-	21.5	6	13±0.2	175.5	-	18.7±0.6	2.5±0.3	-	6	-
MTR-DCI-32S-...-G14	-	-	21.5	6	13±0.2	175.5	-	18.7±0.6	2.5±0.3	-	6	-
MTR-DCI-42S-...-G7	42	42	25	8	11	176	33.3	25±1	2±0.1	25	7±2	10
MTR-DCI-42S-...-G14	42	42	25	8	11	176	46.3	25±1	2±0.1	25	7±2	10
MTR-DCI-52S-...-G7	52	52	32	12	17.3	194	39	33±1	3±0.3	31	10	-
MTR-DCI-52S-...-G14	52	52	32	12	17.3	194	53	33±1	3±0.3	31	10	-

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Ordering data – Modular products

M Mandatory data										
Module No.	Motor unit		Flange/size		Nominal voltage		Measuring system		Parameterisation interface	
	Motor type		Torque class		Plug design		Gearing unit		Electrical connection technology	
533736	MTR	DCI	32	S	VC	SC	E	G7	R2	IO
533742			42					G14	H2	CO
533748			52							PB DN
Order example										
533742	MTR	- DCI	- 42	S	- VC	SC	- E	G7	- R2	IO

Ordering table							
Size	32	42	52	Condi- tions	Code	Enter code	
M Module No.	533736	533742	533748				
Motor unit	Motor unit				MTR	MTR	
Motor type	DC servo motor with integrated position controller				-DCI	-DCI	
Flange/size	32	42	52		-...		
Torque class	Standard torque class				S	S	
Nominal voltage [V]	24 DC				-VC		
Plug design	Straight plug				SC	SC	
Measuring system	Encoder				-E	-E	
Gearing unit	Integrated planetary gearing i = 6.75				G7		
	Integrated planetary gearing i = 13.73				G14		
Parameterisation interface	RS232 interface				-R2		
	RS232 interface + control panel				-H2		
Electrical connection technology	I/O interface				IO		
	CANopen				CO		
	Profibus DP				PB		
	DeviceNet				DN		

Transfer order code

MTR - **DCI** **S** **SC** - **E** - -



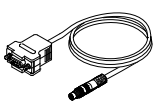
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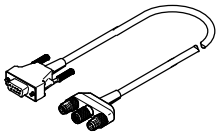
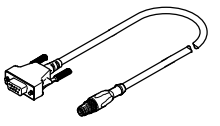
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Accessories

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Ordering data – Cables				
	Brief description	Cable length	Part No.	Type
	Supply cable Allocation →7	2.5 m	537931	KPWR-MC-1-SUB-9HC-2,5
		5 m	537932	KPWR-MC-1-SUB-9HC-5
		10 m	537933	KPWR-MC-1-SUB-9HC-10
	Control cable for I/O connection to any PLC controller Allocation →7	2.5 m	537923	KES-MC-1-SUB-9-2,5
		5 m	537924	KES-MC-1-SUB-9-5
		10 m	537925	KES-MC-1-SUB-9-10
	Programming cable For parameterisation and commissioning via the RS232 interface using FCT software Allocation →7	2.5 m	537926	KDI-MC-M8-SUB-9-2,5


Ordering data – Plugs				
	Brief description	Part No.	Type	
Fieldbus adapter for Profibus				
	<ul style="list-style-type: none"> – 9-pin Sub-D plug to 5-pin round M12 plug/socket, plus round M12 plug for logic voltage supply – Bus terminating resistor must be connected externally 	537934	FBA-PB-SUB-9-3XM12	
Fieldbus adapter for CANopen and DeviceNet				
	<ul style="list-style-type: none"> – 9-pin Sub-D plug to 5-pin round M12 plug – Bus terminating resistor must be connected externally 	540324	FBA-CO-SUB-9-M12	

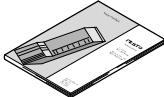
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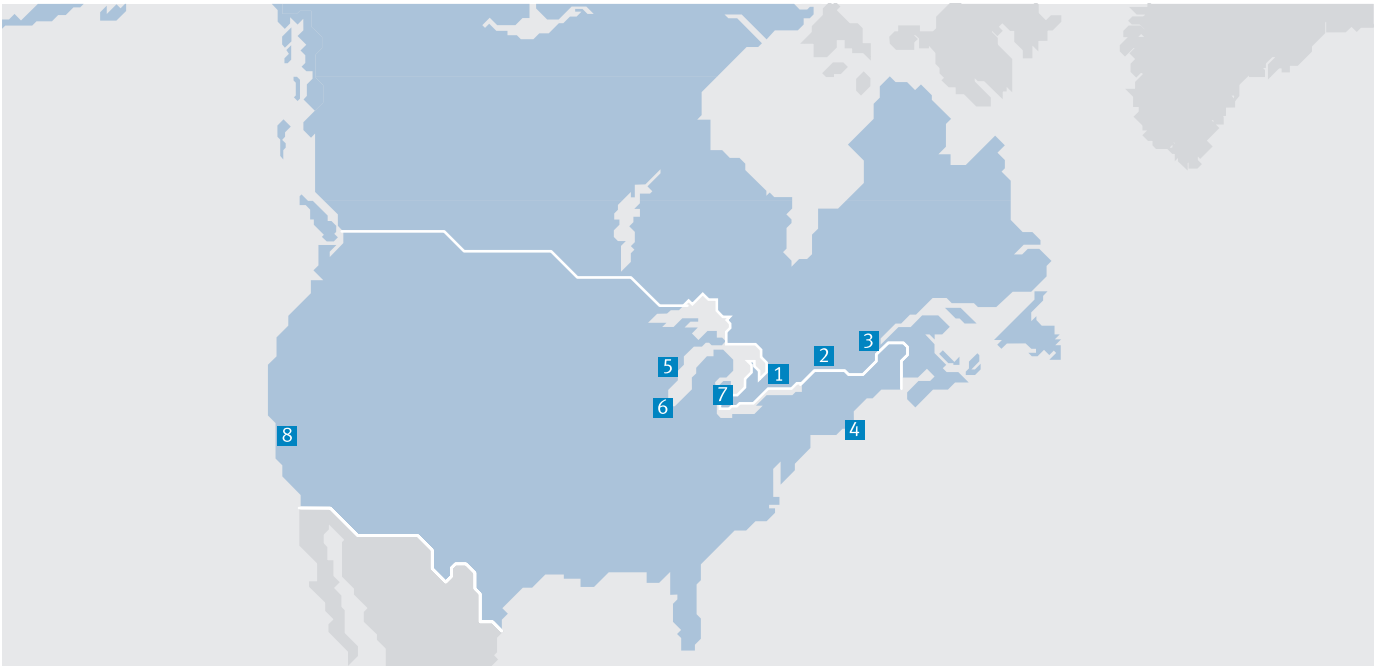
Accessories

Ordering data – Software			
	Brief description	Part No.	Type
	Operator package contains: – CD-ROM – with user documentation for MTR-DCI, in the languages de, en, es, fr, it – with FCT (Festo Configuration Tool) configuration software – Brief description This package is included in the scope of delivery.	550905	P.BP-MTR-DCI

Ordering data – Documentation ¹⁾					
	Language	Part No.		Type	
		For I/O interface		For Profibus interface	
	DE	539615	P.BE-MTR-DCI-IO-DE	539623	P.BE-MTR-DCI-PB-DE
	EN	539616	P.BE-MTR-DCI-IO-EN	539624	P.BE-MTR-DCI-PB-EN
	ES	539617	P.BE-MTR-DCI-IO-ES	539625	P.BE-MTR-DCI-PB-ES
	FR	539618	P.BE-MTR-DCI-IO-FR	539626	P.BE-MTR-DCI-PB-FR
	IT	539619	P.BE-MTR-DCI-IO-IT	539627	P.BE-MTR-DCI-PB-IT
		For CANopen interface		For DeviceNet interface	
	DE	539629	P.BE-MTR-DCI-CO-DE	553530	P.BE-MTR-DCI-DN-DE
	EN	539630	P.BE-MTR-DCI-CO-EN	553531	P.BE-MTR-DCI-DN-EN
	ES	539631	P.BE-MTR-DCI-CO-ES	553532	P.BE-MTR-DCI-DN-ES
	FR	539632	P.BE-MTR-DCI-CO-FR	553533	P.BE-MTR-DCI-DN-FR
	IT	539633	P.BE-MTR-DCI-CO-IT	553534	P.BE-MTR-DCI-DN-IT

1) User documentation in paper form is not included in the scope of delivery

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