ECN 223

Absolute Angle Encoder

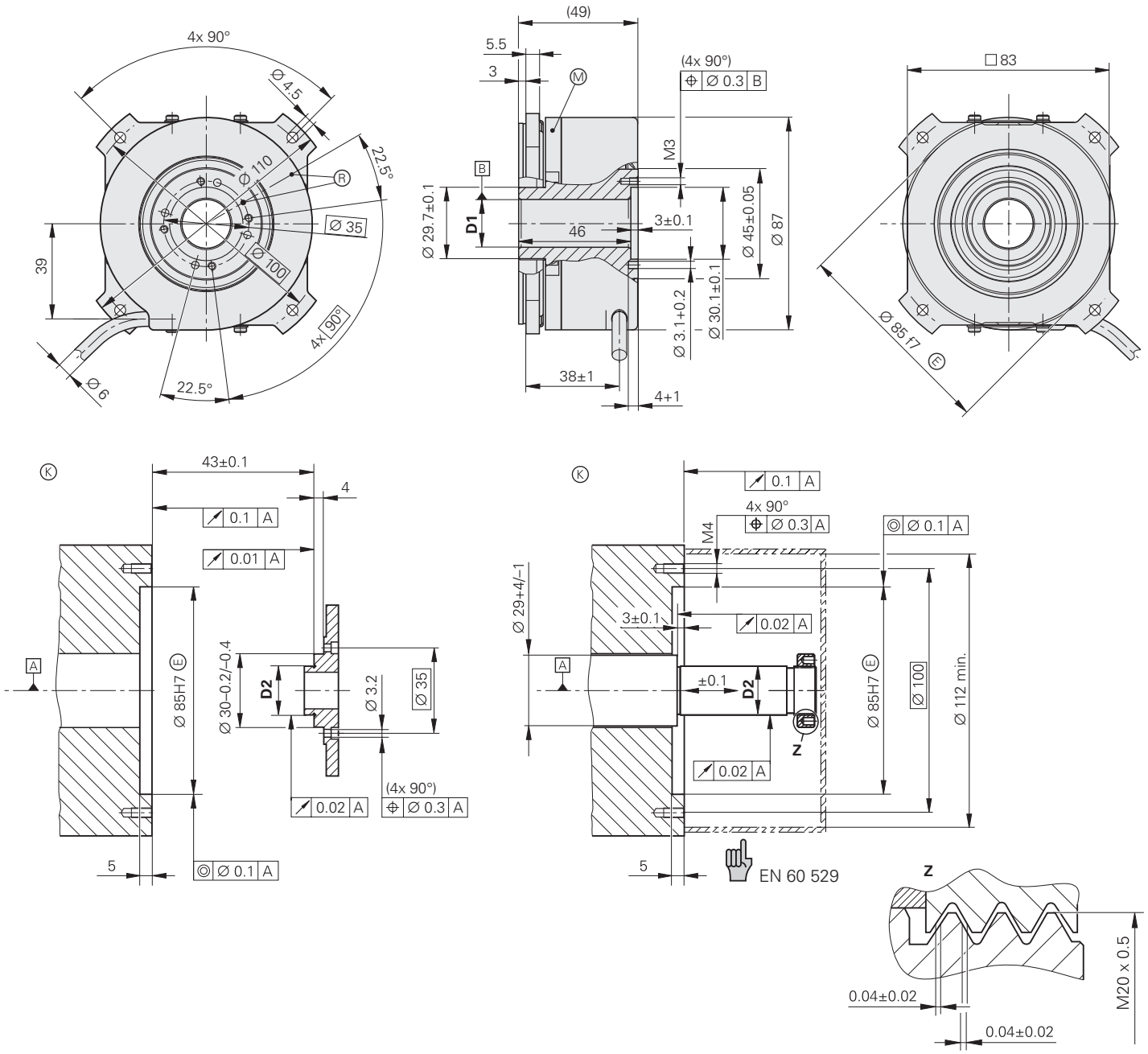
Mechanical design	**Mounted stator coupling** **Centering flange D = 85 mm** **Hollow through shaft D = 20 mm; 50 mm** **Height 49 mm; 56 mm**
Interfaces *ECN 223* *ECN 223 F* *ECN 223 M*	 **EnDat 2.1** **Serial interface – Fanuc 01** **Serial interface – Mitsubishi**
Absolute position values	**Resolution 23 bits (approx. 0.15")** **Approx. ± 10"**
Special features	**Compact dimensions** **Large hollow through shaft**

Specifications

Specifications	ECN 223	ECN 223 F	ECN 223 M
Absolute position values*	EnDat	Fanuc 01 serial interface	Mitsubishi serial interface
Positions per revolution	8388608 (23 bits)		
Elec. permissible speed	1500 rpm		
Recommd. measuring step	0.000 04° ≈ 0.15"		
System accuracy	± 10"		
Power supply	5 V ± 5%/max. 300 mA (without load)		
Electrical connection*	Cable 1 m, with 17-pin coupling or 14-pin Binder coupling (other lengths available on request)	Cable 1 m, with 17-pin coupling (other lengths available on request)	
Max. cable length to subsequent electronics	100 m (329 ft)	20 m (66 ft)	
Mech. permissible speed	3000 rpm		
Starting torque at 20 °C (68 °F)	*D = 20 mm:* ≤ 0.1 Nm *D = 50 mm:* ≤ 0.15 Nm		
Moment of inertia of rotor	*D = 20 mm:* $115 \cdot 10^{-6}$ kgm^2 *D = 50 mm:* $215 \cdot 10^{-6}$ kgm^2		
Natural frequency	≥ 1000 Hz		
Shaft*	Hollow through shaft D = 20 mm, 50 mm		
Permissible axis motion of measured shaft	± 0.1 mm		
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 100 m/s^2 (IEC 60068-2-6) ≤ 1000 m/s^2 (IEC 60068-2-27)		
Max. operating temperature	70 °C (158 °F)		
Min. operating temperature Moving cable Rigid cable	 –10 °C (14 °F) –20 °C (–4 °F)		
Protection IEC 60529	IP 64		
Weight	*D = 20 mm:* 0.8 kg *D = 50 mm:* 0.7 kg		

***** Please indicate when ordering

Mating dimensions for D = 20 mm



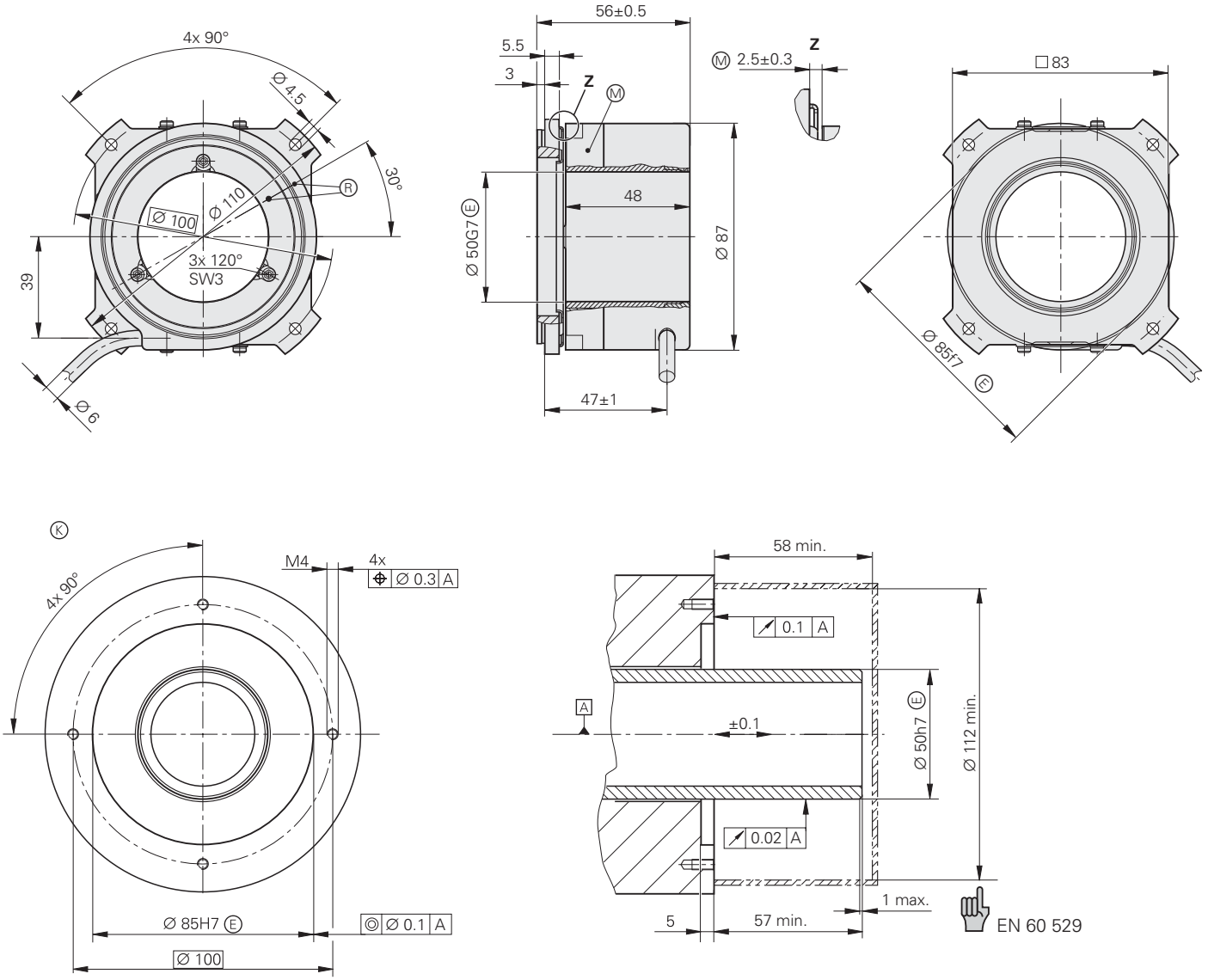
Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H

A = Bearing
K = Required mating dimensions
R = Zero position ± 15°
M = Measuring point for operating temperature

D1 E	D2 E
Ø 20H7	Ø 20g7

Mating dimensions for D = 50 mm



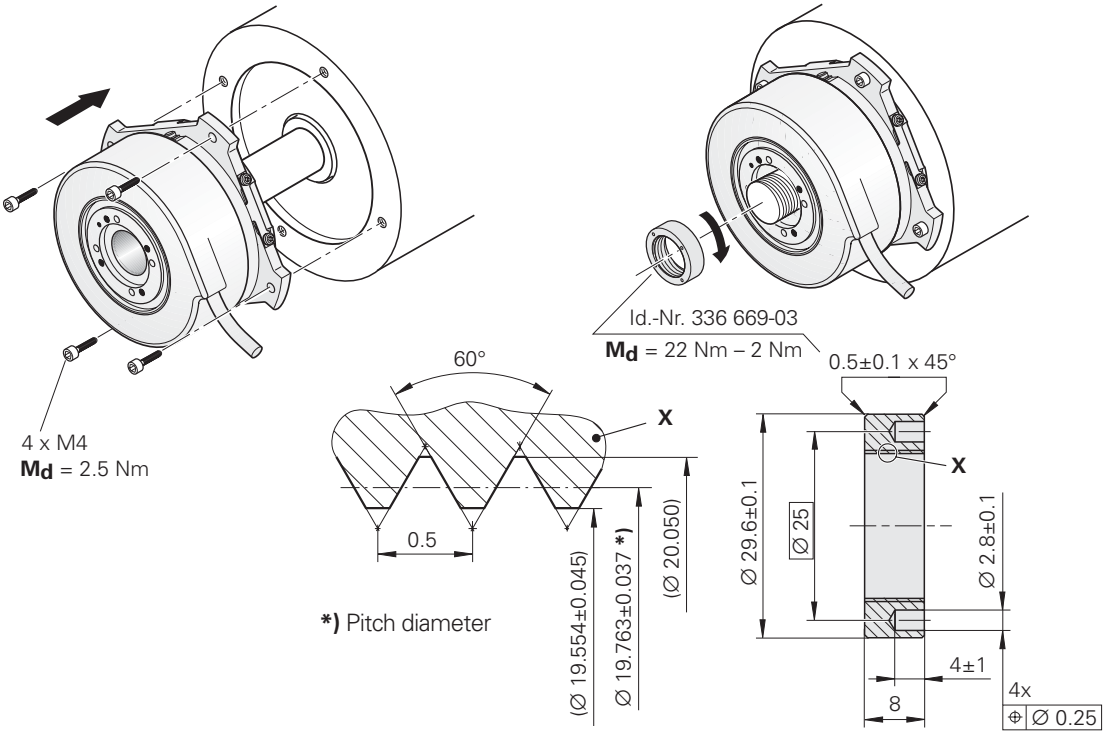
Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H

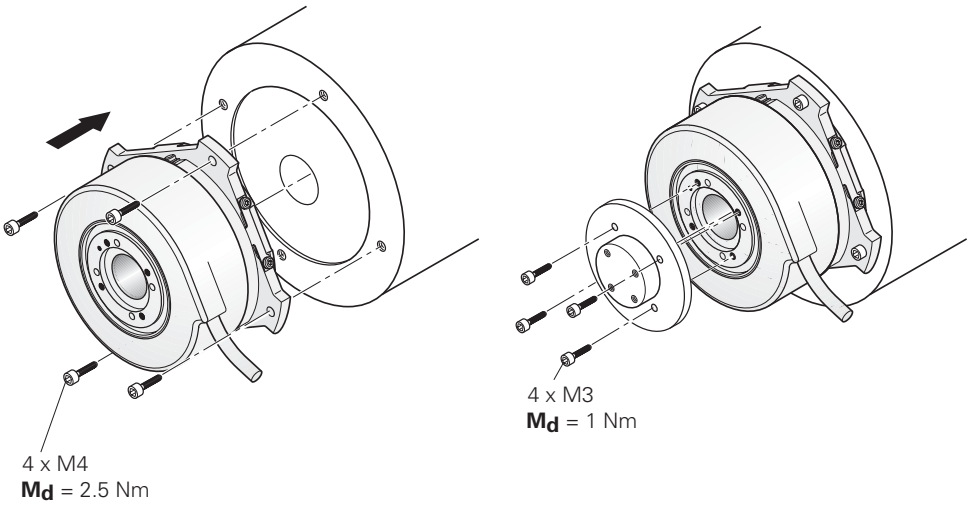
Ⓐ = Bearing
Ⓚ = Required mating dimensions
Ⓡ = Zero position ± 15°
Z = Mounting dimension: Base plate – encoder flange
Ⓜ = Measuring point for operating temperature

Mounting for D = 20 mm

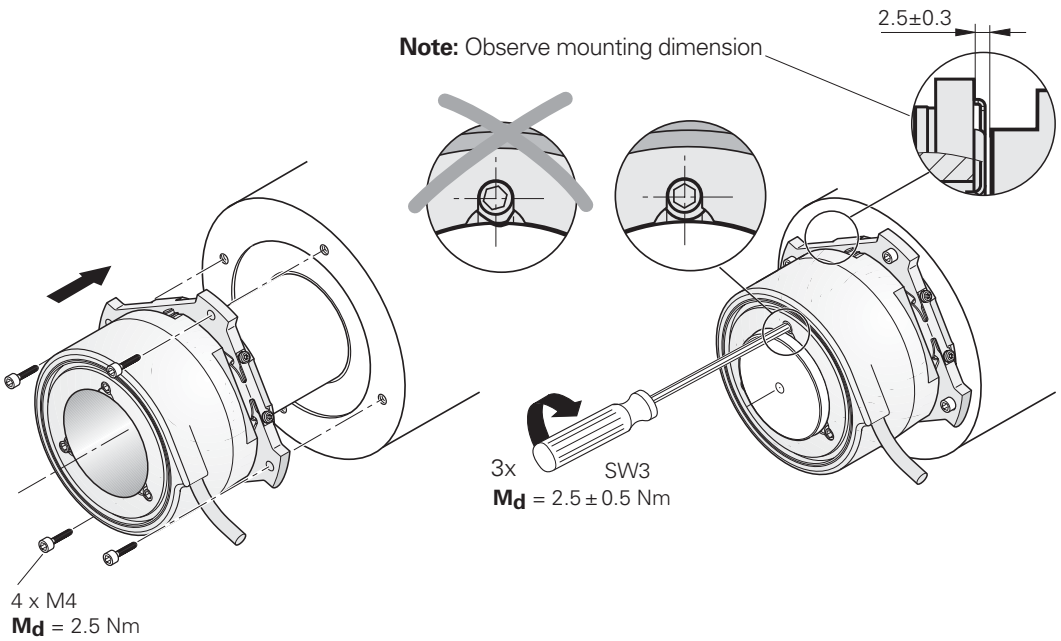
Shaft coupling with ring nut



Front end shaft coupling



Mounting for D = 50 mm

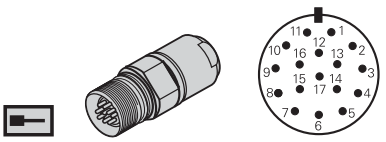


Electrical Connection

Pin Layout

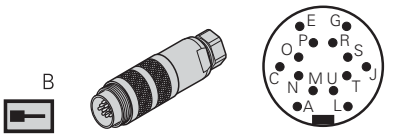
ECN 223

17-pin HEIDENHAIN coupling



14-pin Binder coupling

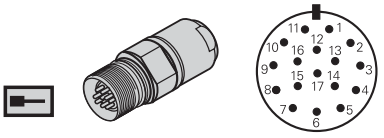
B



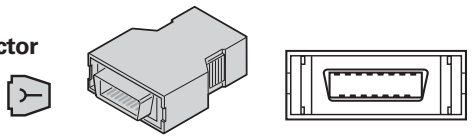
	Power supply				Incremental signals				Absolute position values			
	7	**1**	**10**	**4**	**15**	**16**	**12**	**13**	**14**	**17**	**8**	**9**
B	**O**	**C**	**S**	**N**	**U**	**L**	**T**	**J**	**P**	**E**	**G**	**R**
	U_P	**Sensor** U_P	**0 V**	**Sensor** 0 V	**A+**	**A–**	**B+**	**B–**	**DATA**	**$\overline{\text{DATA}}$**	**CLOCK**	**$\overline{\text{CLOCK}}$**
	Brown/ Green	Blue	White/ Green	White	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Gray	Pink	Violet	Yellow

ECN 223 F

17-pin HEIDENHAIN coupling



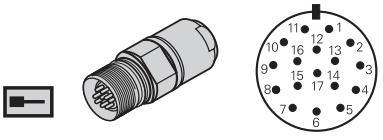
15-pin Fanuc connector
Only on connecting cable



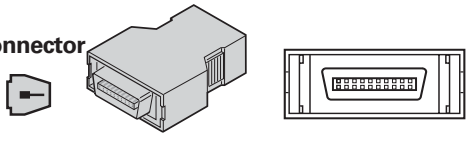
	Power supply				Absolute position values			
	7	**1**	**10**	**4**	**14**	**17**	**8**	**9**
	9	**18/20**	**12**	**14/16**	**1**	**2**	**5**	**6**
	U_P	**Sensor** U_P	**0 V**	**Sensor** 0 V	**Serial Data**	**$\overline{\text{Serial Data}}$**	**Request**	**$\overline{\text{Request}}$**
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

ECN 223 M

17-pin HEIDENHAIN coupling



20-pin Mitsubishi connector
Only on connecting cable



	Power supply				Absolute position values			
	7	**1**	**10**	**4**	**14**	**17**	**8**	**9**
	20	**19**	**1**	**11**	**6**	**16**	**7**	**17**
	U_P	**Sensor** U_P	**0 V**	**Sensor** 0 V	**Serial Data**	**$\overline{\text{Serial Data}}$**	**Request Frame**	**$\overline{\text{Request}}$ Frame**
	Brown/Green	Blue	White/Green	White	Gray	Pink	Violet	Yellow

Shield is on housing; **U_P** = power supply
Sensor: The sensor line is connected internally to the respective power supply.
Vacant pins or wires must not be used.

Connecting cable

Cable diameter 8 mm

ECN 223 with 17-pin coupling	**Complete** with connector (female), 17-pin, and coupling (male) 17-pin  Id. Nr. 323897-xx	**Complete** with connector (female), 17-pin, and D-sub connector (female) for HEIDENHAIN controls and IK 220  Id. Nr. 332115-xx
		Complete with connector (female), 17-pin, and D-sub connector (male) for IK 115  Id. Nr. 324544-xx
	With one connector (female)  Id. Nr. 309778-xx	
ECN 223 with 14-pin Binder coupling	**Complete** with Binder connector (female), 14-pin, and Binder coupling (male), 14-pin  Id. Nr. 348824-xx	**Binder connector (female), 14-pin,** for Binder coupling on encoder cable and connecting cable  Id. Nr. 292275-08
ECN 223 F with 17-pin coupling	**Complete** with connector (female), 17-pin, and coupling (male), 17-pin  Id. Nr. 349314-xx	**Complete** with connector (female), 17-pin, and Fanuc connector  Id. Nr. 360472-xx
ECN 223 M with 17-pin coupling	**Complete** with connector (female), 17-pin, and coupling (male), 17-pin  Id. Nr. 349314-xx	**Complete** with connector (female), 17-pin, and Mitsubishi connector  Id. Nr. 344625-xx

HEIDENHAIN

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