



# INTERROLL DRUM MOTOR 113D



Standard  
Synchronous  
Drum Motors  
113D

Compact and robust drive for smart belt conveyors with high dynamics

## Product Description

**Applications** The drum motor is perfect for high dynamic applications, food conveyors, smart belt and many servo conveyor belt applications.

- ✓ Small feed conveyors with high-duty cycles
- ✓ High performance packaging conveyors
- ✓ Dynamic weighing equipment
- ✓ Smart belts
- ✓ Pick and place applications
- ✓ Food processing (EHEDG)
- ✓ Dry, wet and wash-down applications

- Characteristics**
- ✓ Stainless steel end housings
  - ✓ 3-phase AC synchronous permanent magnet motor
  - ✓ High Torque
  - ✓ Integral motor protection
  - ✓ Steel-hardened planetary gear
  - ✓ Wide variable speed range
  - ✓ Maintenance-free
  - ✓ Lifetime lubricated
  - ✓ High efficiency
  - ✓ New! Oil-free variants now available

**Note:** Synchronous drum motors must be connected to a drive controller and not directly to the mains supply. For feedback or positioning applications use a servo-driver.

## Technical Data

Electrical data	
Motor type	AC Synchronous permanent magnet motor
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)
Voltage	Special voltage on request 230/400 V
Internal shaft sealing system	Double-lipped, FPM
Protection rate	IP69K
Thermal protection (see p 207)	Bi-metal switch
Operating modes (see p 194)	S1
Ambient temperature, 3-phase motor (see p 171)	+5 to +40 °C
General technical data	
Max. shell length SL	900 mm

## Order Information

Please refer to the Configurator at the end of the catalogue.

## Material Versions

You can choose the following versions of drum body components and electrical connection. The versions depend on the material of the components.

Component	Version	Material			
		Mild steel	Stainless steel	Brass / Nickel	Techno-polymer
Shell	Crowned	✓	✓		
	Cylindrical	✓	✓		
	Cylindrical + key, for using sprockets	✓	✓		
End housing	Standard		✓		
Shaft	Standard		✓		
External seal	PTFE				
Electrical connector	Straight connector		✓	✓	
	Straight cable outlet				✓
	Elbow connector		✓		✓
	Straight hygienic connector		✓		

Please contact your Interroll customer consultant for further versions.

## Options

- Lagging for friction drive belts, see p 106
- Lagging for plastic modular belts, see p 112
- Lagging for positive drive solid homogeneous belts, see p 116
- Feedback devices, see p 126
- Food-grade oil (EU, FDA), see p 218
- Low temperature oil, see p 218
- cULus safety certifications, see p 213
- Non-horizontal mounting (more than ± 5°), see p 195
- Oil-free variants
- Reinforced axle see p 98

## Accessories

- Plummer block bracket, see p 144
- Idler pulleys, see p 146
- Conveyor rollers, see p 152



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## Product Range

The following tables give an overview of the possible motor versions. When ordering, please specify the version in accordance with the configurator at the end of the catalogue.

All data and values in this catalogue refer to 200 Hz or 225 Hz operation.

### Motor versions

#### Mechanical data for synchronous motor 113D

$P_N$	np	gs	i	v	$n_A$	$M_A$	$F_N$	Overload factor	$SL_{min}$		
kW				m/s	min <sup>-1</sup>	Nm	N		mm		
0.145	8	1	5	3.566	600.0	2.2	39	3	185		
			8	2.229	375.0	3.5	62	3	185		
		2	12	1.486	250.0	5.1	90	3	200		
			16	1.114	187.5	6.8	120	3	200		
			20	0.891	150.0	8.5	150	3	200		
			25	0.713	120.0	10.6	187	3	200		
			32	0.557	93.8	13.6	239	3	200		
			40	0.446	75.0	17.0	299	3	200		
	3	60	0.297	50.0	24.6	434	3	215			
		80	0.223	37.5	32.9	579	2.9	215			
		100	0.178	30.0	41.1	724	2.3	215			
		120	0.149	25.0	44.9	791	2.1	215			
		160	0.111	18.8	59.8	1054	1.6	215			
		0.298	8	1	5	3.566	600.0	4.5	79	3	235
					8	2.229	375.0	7.2	127	3	235
			2	12	1.486	250.0	10.5	185	3	250	
16	1.114			187.5	14.0	246	3	250			
20	0.891			150.0	17.5	308	3	250			
25	0.713			120.0	21.8	384	3	250			
32	0.557			93.8	27.9	492	3	250			
40	0.446			75.0	34.9	615	2.8	250			
3	60	0.297	50.0	50.7	893	1.9	265				
	0.425	8	1	5	3.566	600.0	6.4	113	3	250	
				8	2.229	375.0	10.3	181	2.8	250	
		2	12	1.486	250.0	14.9	263	3	265		
			16	1.114	187.5	19.9	351	3	265		
			20	0.891	150.0	24.9	439	3	265		
			25	0.713	120.0	31.1	548	3	265		
			32	0.557	93.8	39.8	702	2.4	265		
40			0.446	75.0	49.8	877	1.9	265			
1.100	6	1	8	3.343	562.5	17.7	312	1.6	250		
			12	2.229	375.0	25.7	453	1.7	265		
	2	16	1.671	281.3	34.3	604	1.7	265			
		20	1.337	225.0	42.9	755	1.7	265			
		25	1.070	180.0	53.6	944	1.7	265			

#### Mechanical data for synchronous motor 113D oil-free

$P_N$	np	gs	i	v	$n_A$	$M_A$	$F_N$	Overload factor	$SL_{min}$		
kW				m/s	min <sup>-1</sup>	Nm	N		mm		
0.080	8	1	5	3.566	60.0	1.2	21	3	185		
			8	2.229	375.0	1.9	33	3	185		
			12	1.486	250.0	2.8	49	3	200		
			16	1.114	187.5	3.7	65	3	200		
		2	20	0.891	150.0	4.6	81	3	200		
			25	0.713	120.0	5.8	101	3	200		
			32	0.557	93.8	7.4	130	3	200		
			40	0.446	75.0	9.2	162	3	200		
	3	60	0.297	50.0	13.4	235	3	215			
		80	0.223	37.5	17.8	314	3	215			
		100	0.178	30.0	22.3	392	3	215			
		120	0.149	25.0	24.3	428	3	215			
		160	0.111	18.8	32.4	571	3	215			
		0.110	8	1	5	3.566	600.0	1.7	29	3	235
					8	2.229	375.0	2.7	47	3	235
				2	12	1.486	250.0	3.9	68	3	250
16	1.114				187.5	5.2	91	3	250		
20	0.891				150.0	6.4	113	3	250		
25	0.713				120.0	8.1	142	3	250		
32	0.557				93.8	10.3	182	3	250		
40	0.446				75.0	12.9	227	3	250		
3	60		0.297	50.0	18.7	329	3	265			
	0.180		8	1	5	3.566	600.0	2.7	48	3	250
					8	2.229	375.0	4.3	76	3	250
			2	12	1.486	250.0	6.3	111	3	265	
				16	1.114	187.5	8.4	148	3	265	
				20	0.891	150.0	10.5	185	3	265	
				25	0.713	120.0	13.1	231	3	265	
				32	0.557	93.8	16.8	296	3	265	
40		0.446		75.0	21.0	370	3	265			
0.670	6	1	8	3.343	562.5	10.8	190	2.7	250		
			12	2.229	375.0	15.7	276	2.8	265		
	2	16	1.671	281.3	20.9	368	2.8	265			
		20	1.337	225.0	26.1	460	2.8	265			
		25	1.070	180.0	32.7	576	2.8	265			

$P_N$	Rated power
np	Number of poles
gs	Gear stages
i	Gear ratio
v	Rated velocity of the shell
$n_A$	Rated revolutions of the drum shell
$M_A$	Rated torque of drum motor
$F_N$	Rated belt pull of drum motor
$SL_{min}$	Min. shell length



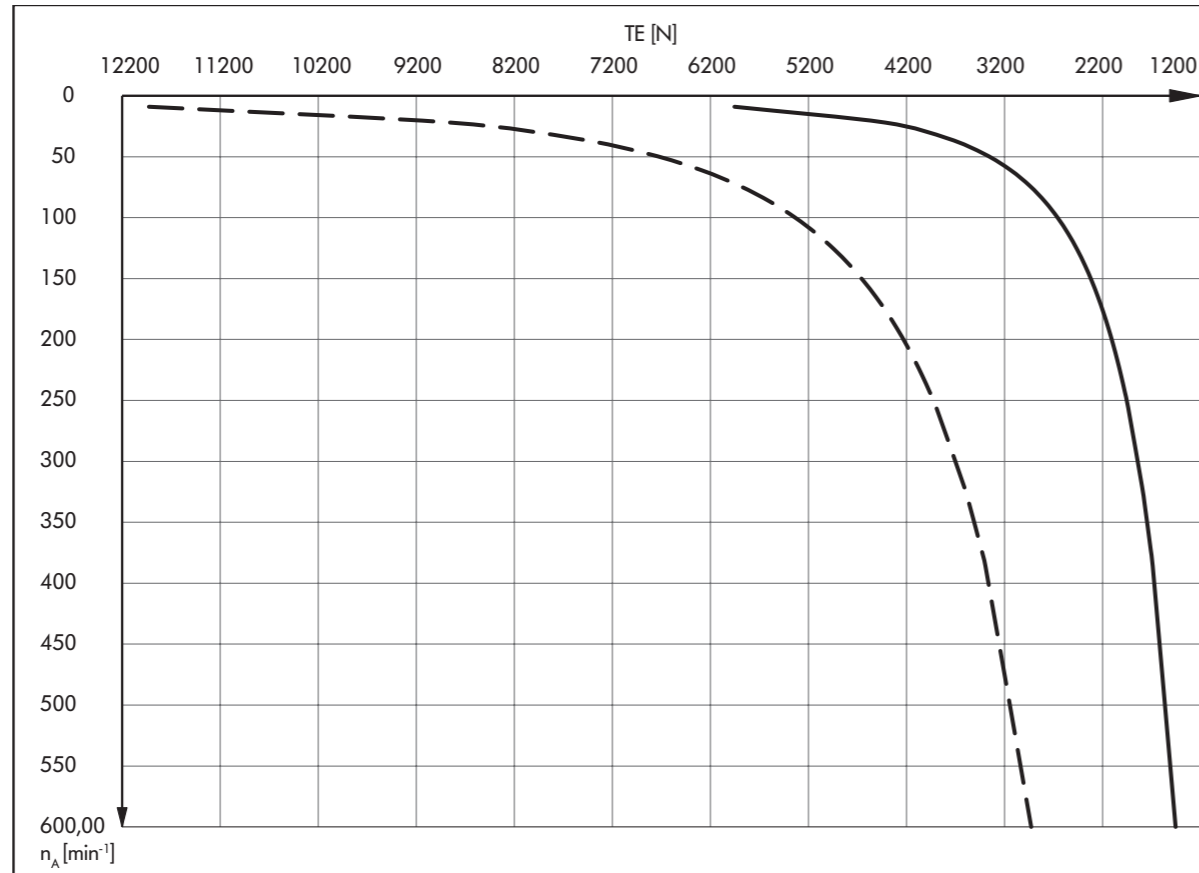
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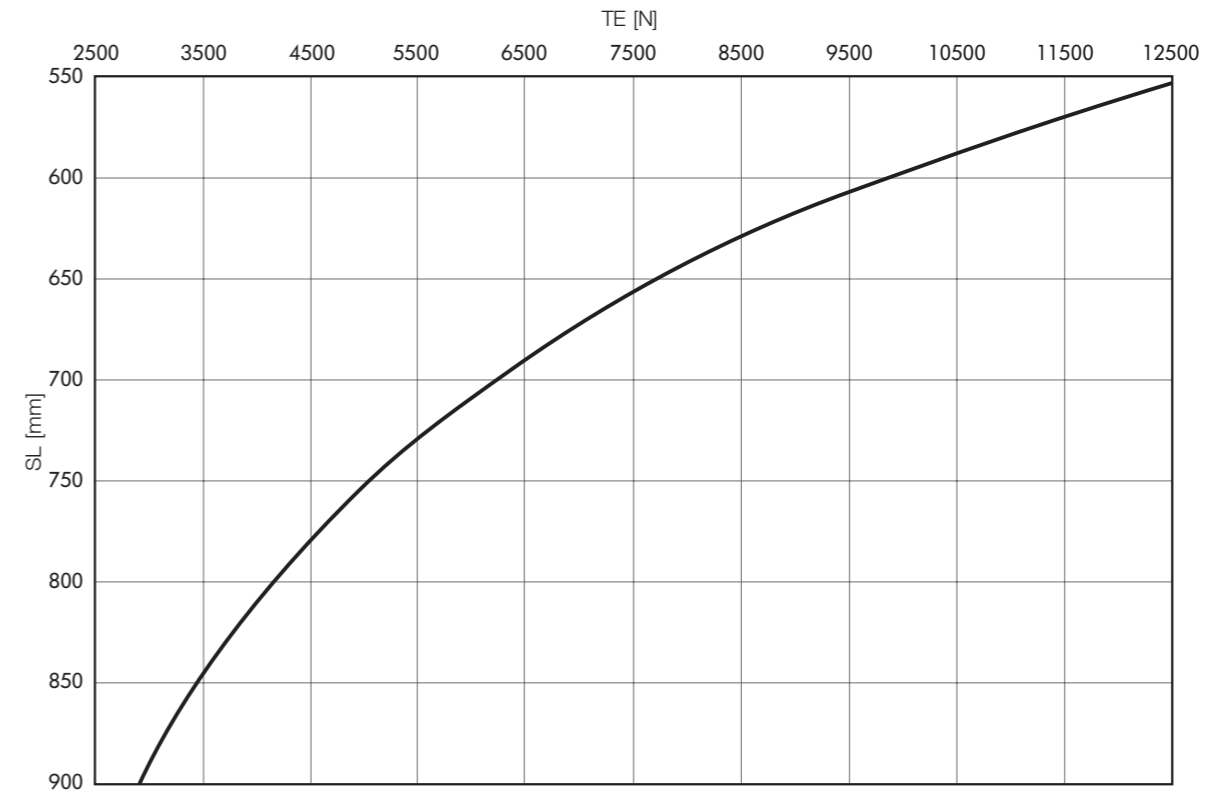
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Belt Tension



— Standard design  
- - - Reinforced axle, optional



TE	Belt Tension
$n_A$	Rated revolutions of the drum shell
SL	Shell length

**Note:** To get the right value of the maximum allowed belt tension, find the maximum allowed TE value for the drum motor RPM. The TE value for SL does not need to be considered for standard 113D.



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## Electrical data for synchronous motor 113D

$P_N$ kW	$U_N$ V	np	$U_L$ V DC	$I_N$ A	$M_N$ Nm	$\eta$	$f_N$ Hz	$n_N$ min <sup>-1</sup>	$T_e$ ms	$K_E$ V/krpm	$K_{TN}$ Nm/A	$I_0$ A	$M_0$ Nm	$I_{MAX}$ A	$M_{MAX}$ Nm	$J_R$ kgcm <sup>2</sup>	$R_{M20}$ $\Omega$	$R_{M75}$ $\Omega$	$L_{sd}$ mH	$L_{sq}$ mH
0.145	400	8	560	0.47	0.46	0.83	200	3000	4.41	72.23	0.98	0.47	0.46	1.41	1.38	0.1413	62.54	75.95	130.7	138.0
	230	8	325	0.81	0.46	0.85	200	3000	4.97	41.57	0.57	0.81	0.46	2.43	1.38	0.1413	21.62	26.26	45.60	53.70
0.298	400	8	560	0.78	0.95	0.87	200	3000	6.48	83.09	1.22	0.78	0.95	2.34	2.85	0.2826	29.06	35.29	81.90	94.10
	230	8	325	1.30	0.95	0.86	200	3000	5.75	47.46	0.73	1.30	0.95	3.90	2.85	0.2826	10.20	12.39	27.80	29.30
0.425	400	8	560	1.32	1.35	0.86	200	3000	6.70	80.80	1.02	1.32	1.35	3.96	4.05	0.4239	17.60	21.38	49.80	59.00
	230	8	325	2.30	1.35	0.87	200	3000	6.86	45.81	0.59	2.30	1.35	6.90	4.05	0.4239	5.66	6.87	16.26	19.42
1.100	400	6	560	2.31	2.33	0.87	225	4500	6.39	65.7	1.01	2.31	2.33	3.97	4.00	0.7200	4.85	5.90	13.20	15.50

## Electrical data for synchronous motor 113D oil-free

$P_N$ kW	$U_N$ V	np	$U_L$ V DC	$I_N$ A	$M_N$ Nm	$\eta$	$f_N$ Hz	$n_N$ min <sup>-1</sup>	$T_e$ ms	$K_E$ V/krpm	$K_{TN}$ Nm/A	$I_0$ A	$M_0$ Nm	$I_{MAX}$ A	$M_{MAX}$ Nm	$J_R$ kgcm <sup>2</sup>	$R_{M20}$ $\Omega$	$R_{M75}$ $\Omega$	$L_{sd}$ mH	$L_{sq}$ mH
0.080	400	8	560	0.26	0.25	0.83	200	3000	4.41	72.23	0.98	0.26	0.25	0.78	0.76	0.1413	62.54	75.95	130.70	138.0
	230	8	325	0.45	0.25	0.85	200	3000	4.97	41.57	0.57	0.45	0.25	1.34	0.76	0.1413	21.62	26.26	45.60	53.70
0.110	400	8	560	0.29	0.35	0.87	200	3000	6.48	83.09	1.22	0.29	0.35	0.86	1.05	0.2826	29.06	35.29	81.90	94.10
	230	8	325	0.48	0.35	0.86	200	3000	5.75	47.46	0.73	0.48	0.35	1.44	1.05	0.2826	10.20	12.39	27.80	29.30
0.180	400	8	560	0.56	0.57	0.86	200	3000	6.70	80.80	1.02	0.56	0.57	1.69	1.72	0.4239	17.60	21.38	49.80	59.0
	230	8	325	1.97	0.57	0.87	200	3000	6.86	45.81	0.59	0.97	0.57	2.91	1.72	0.4239	5.66	6.87	16.26	19.42
0.670	400	6	560	1.48	1.42	0.88	225	4500	6.39	65.7	0.96	1.48	1.42	4.17	4.0	0.7200	4.85	5.90	13.20	15.50

$P_N$	Rated power
np	Number of poles
$U_N$	Rated voltage
$U_L$	DC link voltage
$I_N$	Rated current
$M_N$	Rated torque of rotor
$\eta$	Efficiency
$f_N$	Rated frequency
$n_N$	Rated speed of rotor
$T_e$	Electrical time constant
$k_e$	BEMF (Back Electromotive Force) constant: effective phase to phase
$k_{TN}$	Torque constant
$I_0$	Standstill current
$M_0$	Standstill torque
$I_{MAX}$	Maximum current
$M_{MAX}$	Maximum torque
$J_R$	Rotor moment of inertia
$R_{M20}$	Phase to phase resistance at 20 °C
$R_{M75}$	Phase to phase resistance at 75 °C
$L_{SD}$	d-axis inductance
$L_{SQ}$	q-axis inductance

## Cable Specifications

Available cables for connectors (see also p 214):

- Standard, screened
- Halogen-free, screened

Available length: 1 / 3 / 5 / 10 m

## Connection Diagrams

For connection diagrams, see Planning Section on p 225.



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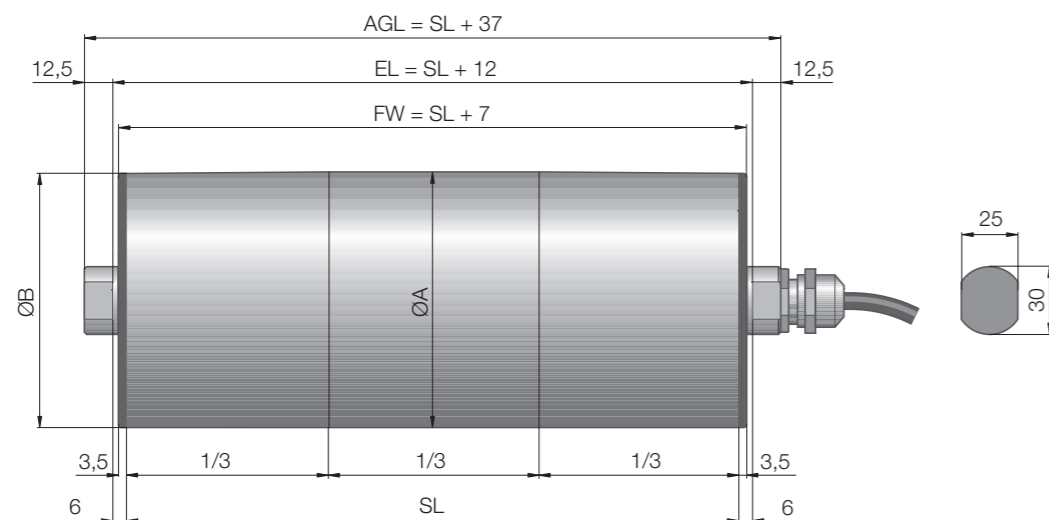


Standard  
Synchronous  
Drum Motors  
113D

Compact and robust drive for smart belt conveyors with high dynamics

Standard  
dimensions

## Dimensions



Type	Ø A mm	Ø B mm
113D crowned shell	113.5	112.0
113D cylindrical shell	112.0	112.0
113D cylindrical shell + key	113.0	113.0

Connector  
dimensions

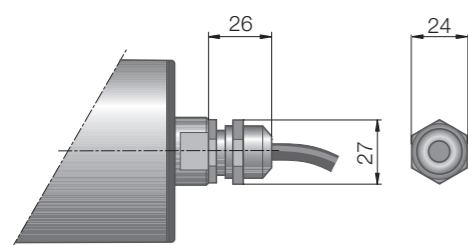


Fig.: Straight connector, brass/nickel or stainless steel

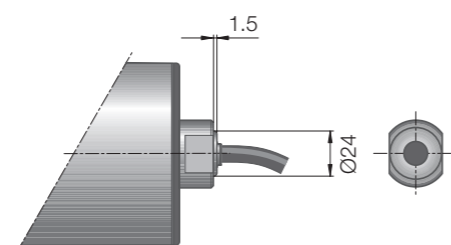


Fig.: Straight cable outlet, PU shaft plug

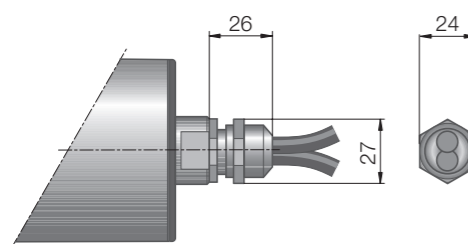


Fig.: Straight connector / Feedback device, brass/nickel or stainless steel

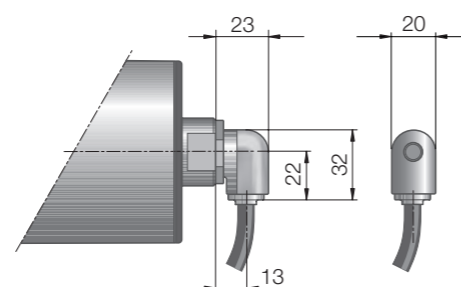


Fig.: Elbow connector, technopolymer

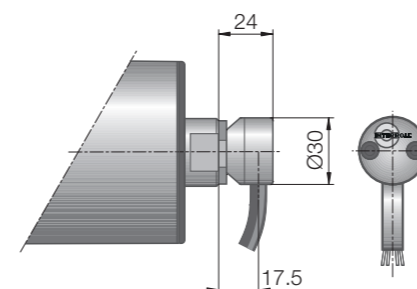


Fig.: Elbow connector, stainless steel

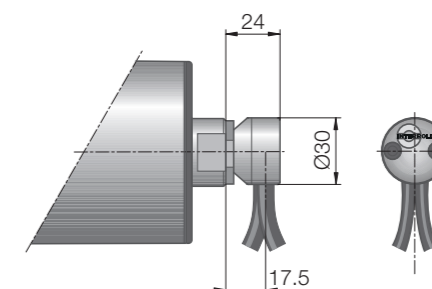


Fig.: Elbow connector / Feedback device, stainless steel

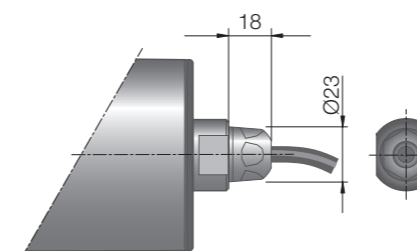


Fig.: Straight hygienic connector, IP69k stainless steel

The following options increase the minimum length of the drum motor.

Option	Min. SL with option mm
Feedback device	Min. SL + 75 (SL + 90 for Hiperface feedback option)
Reinforced axle	Min. SL + 90

Min. length with  
option

Standard drum motor lengths and their weights:

Shell length SL in mm	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
Average weight in kg	9.8	10.6	11.3	12.0	12.8	13.5	14.3	15.0	15.7	16.4	17.1	17.9	18.6	19.3	20.0

Standard length  
and weight