Practice-oriented, scalable and thought out in detail: The new drum motor DM 0113 makes it easy to build a completely individual conveyor system and is dimensioned for the higher requirements for permissible belt tension from industry and belt manufacturers.

With a broader speed spectrum, the DM 0113 covers all possible applications. The clever plug-and-play connection significantly simplifies the installation. Each motor is approved, tested, and modularized so that it can be produced and delivered around the world in the shortest amount of time.

The modular design of the DM 0113 allows a free combination of individual module groups, such as shaft, end cover, shell or steel gear, asynchronous or synchronous motor winding, to perfectly meet the requirements of an application. In addition, various options, such as encoder, brake, backstop, rubber laggings, etc., as well as different accessories are available.

With the platform concept of the DM 0113, it is possible to cover all internal logistics applications in the food processing sector, as well as in industry, distribution and airports.

DRUM MOTOR
DM 0113

Technical data

	Asynchronous squirrel cage motor	AC synchronous permanent magnet motor
Insulation class of motor windings	Class F, IEC 34 (VDE 0530)	Class F, IEC 34 (VDE 0530)
Voltage	230/400 V ±5 % (IEC 34/38) Most of the common international voltages and frequencies are available upon request	230 or 400 V
Frequency	50 Hz	150 Hz
Shaft seal, internal	NBR	NBR
Protection rate	IP69K	IP69K
Thermal protection	Bi-metal switch	Bi-metal switch
Operating mode	S1	S1
Ambient temperature, 3-phase motor	+2 to + 40 °C Low temperature ranges on request	+2 to + 40 °C Low temperature ranges on request
Ambient temperature, 3-phase motor for applications with positive driven belts or no belt	+2 to +25 °C	+2 to +40 °C

Design variants and accessories

Laggings	Lagging for friction drive belts Lagging for modular plastic belts Lagging for positive drive solid homogeneous belts
Sprockets	Sprockets for modular plastic belts
Options	Backstop Electromagnetic holding brake and rectifier Feedback devices Balancing Plug connection
Oils	Food-grade oils (EU, FDA)
Certificate	cULus safety certificates (starting Q1/2019)
Accessories	Idler pulleys; conveyor rollers; mounting brackets; cables; inverters

A combination of encoder and safety holding brake is not possible. In addition, the use of a backstop with a synchronous motor is technically not meaningful.

Material variants

The following components can be selected for the drum motor and the electrical connection.
The combination of components depends on the material used.

Component	Version	Aluminum	Mild steel	Stainless steel	Brass/nickel	Technopolymer
Shell	Crowned		●	●		
	Cylindrical		●	●		
	Cylindrical + key for sprockets		●	●		
End housing	Standard	●		●		
Shaft	Standard		●	●		
	Cross-drilled thread		●	●		
Gear boxes	Planetary gear box		●			
Electrical connector	Straight connector			●	●	●
	Straight hygienic connector			●		
	Elbow connector			●		●
	Terminal box	●		●		
	Straight plug connection			●		
Motor winding	Asynchronous motor					
	Synchronous motor					
External seal	PTFE					

DRUM MOTOR
DM 0113

Motor variants

Mechanical data for synchronous motors with steel gear

P_N [W]	np	gs	i	v [m/s]	n_A [min^{-1}]	M_A [Nm]	F_N [N]	M_{MAX}/M_A	FW_{MIN} [mm]	SL_{MIN} [mm]
300	4	3	168	0.16	26.8	91.7	1623	1.5	227	220
300	4	3	120	0.22	37.5	65.5	1159	2.1	227	220
300	4	3	100	0.27	45.0	54.6	966	2.5	227	220
300	4	3	80	0.33	56.3	43.7	773	3	227	220
300	4	2	63	0.42	71.4	36.2	641	3	207	200
300	4	2	45	0.59	100	25.9	458	3	207	200
300	4	2	36	0.74	125	20.7	366	3	207	200
300	4	2	30	0.89	150	17.2	305	3	207	200
300	4	2	24	1.11	187.5	13.8	244	3	207	200
300	4	2	20	1.33	225	11.5	203	3	207	200
300	4	2	16	1.66	281.3	9.2	163	3	207	200
300	4	2	12	2.22	375	6.9	122	3	207	200
300	4	1	9	2.96	500	5.4	96	3	207	200
700	4	3	80	0.33	56.3	101.9	1803	1.3	257	250
700	4	2	63	0.42	71.4	84.5	1495	1.7	237	230
700	4	2	45	0.59	100	60.3	1068	2.4	237	230
700	4	2	36	0.74	125	48.3	854	3	237	230
700	4	2	30	0.89	150	40.2	712	3	237	230
700	4	2	24	1.11	187.5	32.2	569	3	237	230
700	4	2	20	1.33	225	26.8	475	3	237	230
700	4	2	16	1.66	281.3	21.4	380	3	237	230
700	4	2	12	2.22	375	16.1	285	3	237	230
700	4	1	9	2.96	500	12.7	225	3	237	230

P_N [W]	np	gs	i	v [m/s]	n_A [min^{-1}]	M_A [Nm]	F_N [N]	M_{MAX}/M_A	FW_{MIN} [mm]	SL_{MIN} [mm]
1100	4	2	63	0.42	71.4	132.7	2349	1.1	267	260
1100	4	2	45	0.59	100	94.8	1678	1.5	267	260
1100	4	2	36	0.74	125	75.8	1342	1.9	267	260
1100	4	2	30	0.89	150	63.2	1119	2.3	267	260
1100	4	2	24	1.11	187.5	50.6	895	2.8	267	260
1100	4	2	20	1.33	225	42.1	746	3	267	260
1100	4	2	16	1.66	281.3	33.7	597	3	267	260
1100	4	2	12	2.22	375	25.3	447	3	267	260
1100	4	1	9	2.96	500	20.0	353	3	267	260

P_N = Rated power
np = Number of poles
gs = Gear stages
i = Speed ratio
v = Speed
n_A = Shell rated speed
M_A = Drum motor rated torque
F_N = Drum motor rated belt pull
M_{MAX}/M_A = Ratio of max. acceleration torque to rated torque
FW_{MIN} = Minimum drum width
SL_{MIN} = Minimum shell length

DRUM MOTOR
DM 0113

Electrical data for synchronous motors

P_N [W]	np	U_N [V]	I_N [A]	I_0 [A]	I_{MAX} [A]	f_N [Hz]	η	n_N [rpm]	J_R [kgcm^2]	M_N [Nm]	M_0 [Nm]	M_{MAX} [Nm]	R_M [Ω]	L_{SD} [mH]	L_{SQ} [mH]	k_e [V/krpm]	T_e [ms]	k_{TN} [Nm/A]	U_{SH} [V]
300	4	230	1.3	1.3	3.9	150	0.88	4500	0.01	0.64	0.64	1.91	16.1	68.67	101.33	40.41	12.59	0.49	31
300	4	400	0.75	0.75	2.25	150	0.88	4500	0.01	0.64	0.64	1.91	48.3	206.0	304.0	69.99	12.59	0.85	54
700	4	230	2.91	2.91	8.73	150	0.91	4500	0.02	1.49	1.49	4.46	3.8	26.47	38.93	39.57	20.49	0.51	17
700	4	400	1.68	1.68	5.04	150	0.91	4500	0.02	1.49	1.49	4.46	11.4	79.40	116.8	68.54	20.49	0.88	29
1100	4	230	3.62	3.62	10.86	150	0.92	4500	0.04	2.33	2.33	7.0	2.37	19.27	28.40	42.77	24.00	0.64	13
1100	4	400	2.09	2.09	6.27	150	0.92	4500	0.04	2.33	2.33	7.0	7.1	57.80	85.20	74.08	24.00	1.12	22

P_N = Rated power
np = Number of poles
U_N = Rated voltage
I_N = Rated current
I_0 = Standstill current
I_{MAX} = Maximum current
f_N = Rated frequency
η = Efficiency
n_N = Rated torque of rotor
J_R = Rotor moment of inertia
M_N = Rated torque of rotor
M_0 = Standstill torque
M_{MAX} = Maximum torque
R_M = Phase to phase resistance
L_{SD} = d-axis inductance
L_{SQ} = q-axis inductance
k_e = EMF (mutual induction voltage constant)
T_e = Electrical time constant
k_{TN} = Torque constant
U_{SH} = Heating voltage

DRUM MOTOR
DM 0113

Mechanical data for 3-phase asynchronous motor with steel gear

P_N [W]	np	gs	i	v [m/s]	n_A [min^{-1}]	M_A [Nm]	F_N [N]	FW_{MIN} [mm]	SL_{MIN} [mm]
160	4	3	168	0.05	8.3	157	2779	307	300
160	4	3	150	0.06	9.3	140.2	2481	307	300
160	4	3	120	0.07	11.6	112.1	1985	307	300
160	4	2	73.8	0.11	18.9	72.6	1285	257	250
160	4	2	63	0.13	22.2	62	1097	257	250
160	4	2	45	0.18	31	44.3	783	257	250
160	4	2	36	0.23	38.8	35.4	627	257	250
160	4	2	30	0.28	46.6	29.5	533	257	250
160	4	2	27	0.31	51.7	26.6	470	257	250
160	4	2	24	0.34	58.2	23.6	418	257	250
160	4	2	20	0.41	69.9	19.7	348	257	250
160	4	2	16	0.52	87.3	15.7	279	257	250
160	4	2	12	0.69	116.4	11.8	209	257	250
160	4	1	9	0.92	155.2	9.3	165	257	250
225	2	2	73.8	0.22	37.4	52	919	257	250
225	2	2	63	0.26	43.8	44.3	785	257	250
225	2	2	45	0.36	61.3	31.7	561	257	250
225	2	2	36	0.45	76.6	25.3	449	257	250
225	2	2	30	0.54	91.9	21.1	374	257	250
225	2	2	27	0.6	102.1	19	336	257	250
225	2	2	24	0.68	114.9	16.9	299	257	250
225	2	2	20	0.82	137.9	14.1	249	257	250
225	2	1	16	1.02	172.4	11.3	199	257	250
255	2	2	12	1.36	229.8	8.4	150	257	250
255	2	1	9	1.81	306.4	6.7	118	257	250
370	4	2	63	0.13	22	145	2566	307	300
370	4	2	45	0.18	30.8	103.6	1833	307	300
370	4	2	36	0.23	38.6	82.8	1466	307	300
370	4	2	30	0.27	46.3	69	1222	307	300
370	4	2	27	0.3	51.4	62.1	1100	307	300
370	4	2	24	0.34	57.8	55.2	978	307	300
370	4	2	20	0.41	69.4	46	815	307	300
370	4	2	16	0.51	86.8	36.8	652	307	300
370	4	2	12	0.68	115.7	27.6	489	307	300
370	4	1	9	0.91	154.2	21.8	386	307	300
370	2	2	73.8	0.22	37.7	84.6	1497	307	300
370	2	2	45	0.37	61.8	51.6	913	307	300
370	2	2	36	0.46	77.2	41.3	730	307	300
370	2	2	30	0.55	92.6	34.4	609	307	300
370	2	2	27	0.61	102.9	30.9	548	307	300
370	2	2	20	0.82	139	22.9	406	307	300
370	2	2	16	1.03	173.7	18.3	325	307	300
370	2	1	9	1.83	308.8	10.9	192	307	300
550	2	2	36	0.46	78.1	60.8	1075	317	310
550	2	2	30	0.55	93.8	50.6	896	317	310
550	2	2	27	0.62	104.2	45.6	806	317	310
550	2	2	24	0.69	117.2	40.5	717	317	310
550	2	2	20	0.83	140.7	33.8	597	317	310
550	2	2	16	1.04	175.8	27	478	317	310
550	2	2	12	1.39	234.4	20.3	358	317	310
550	2	1	9	1.85	312.6	16	283	317	310

For applications with positive driven belts or applications without belt, the power must be reduced by 17 %.

P_N = Rated power
np = Number of poles
gs = Gear stages
i = Speed ratio
v = Speed
n_A = Shell rated speed
M_A = Drum motor rated torque
F_N = Drum motor rated belt pull
FW_{MIN} = Minimum drum width
SL_{MIN} = Minimum shell length

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Electrical data for 3-phase asynchronous motor

P_N [W]	np	n_N [min^{-1}]	f_N [Hz]	U_N [V]	I_N [A]	cosφ	η [%]	J_R [$kgcm^2$]	I_S/I_N	M_S/M_N	M_P/M_N	M_B/M_N	M_N [Nm]	R_M [Ω]	$U_{SH\Delta}$ [V]	U_{SHY} [V]
160	4	1397	50	400	0.54	0.7	60.5	3.8	3.05	1.92	1.92	2.13	1.09	63.7		36.4
160	4	1397	50	230	0.54	0.7	60.5	3.8	3.05	1.92	1.92	2.13	1.09	64	21	
225	2	2758	50	400	0.56	0.86	67.8	2.5	4.32	2.57	2.57	2.62	0.78	39.3		28.1
225	2	2758	50	230	0.96	0.86	67.8	2.5	4.32	2.57	2.57	2.62	0.78	39.3	16.2	
370	4	1388	50	400	1.1	0.71	68.0	6.8	3.67	2.35	2.29	2.43	2.55	22.1		25.8
370	4	1388	50	230	1.9	0.71	68.0	6.8	3.67	2.35	2.29	2.43	2.55	22.1	14.9	
370	2	2779	50	400	0.82	0.87	74.2	4.4	5.47	2.91	2.88	2.91	1.27	19.9		21.3
370	2	2779	50	230	1.42	0.87	74.2	4.4	5.47	2.91	2.88	2.91	1.27	19.9	12.3	
550	2	2813	50	400	1.23	0.85	76.5	5.4	5.77	3.27	3.15	3.27	1.87	11.6		18.1
550	2	2813	50	230	2.13	0.85	76.5	5.4	5.77	3.27	3.15	3.27	1.87	11.6	10.5	

P_N = Rated power
n_P = Number of poles
n_N = Rated speed of rotor
f_N = Rated frequency
U_N = Rated voltage
I_N = Rated current
cosφ = Power factor
η = Efficiency
J_R = Rotor moment of inertia
I_S/I_N = Ratio of startup current - rated current
M_S/M_N = Ratio of startup torque - rated torque
M_B/M_N = Ratio of pull-out torque - rated torque
M_P/M_N = Ratio of pull-up torque - rated torque
M_N = Rated torque of rotor
R_M = Branch resistance
$U_{SH\Delta}$ = Heater voltage in delta connection
U_{SHY} = Heater voltage in star connection

DRUM MOTOR
DM 0113

Mechanical data for 1-phase asynchronous motor with steel gear

P_N [W]	np	gs	i	v [m/s]	n_A [1/min]	M_A [Nm]	F_N [N]	FW_{MIN} [mm]	SL_{MIN} [mm]
250	4	2	45	0.18	30.2	71.5	1265	307	300
250	4	2	36	0.22	37.8	57.2	1012	307	300
250	4	2	30	0.27	45.3	47.7	843	307	300
250	4	2	27	0.3	50.4	42.9	759	307	300
250	4	2	24	0.34	56.7	38.1	675	307	300
250	4	2	20	0.4	68	31.8	562	307	300
250	4	2	16	0.5	85	25.4	450	307	300
250	4	2	12	0.67	113.3	19.1	337	307	300

For applications with positive driven belts or applications without belt, this combination of motor and gear box is not recommended.

P_N = Rated power
np = Number of poles
gs = Gear stages
i = Speed ratio
v = Speed
n_A = Shell rated speed
M_A = Drum motor rated torque
F_N = Drum motor rated belt pull
M_{MAX}/M_A = Ratio of max. acceleration torque to rated torque
FW_{MIN} = Minimum drum width
SL_{MIN} = Minimum shell length

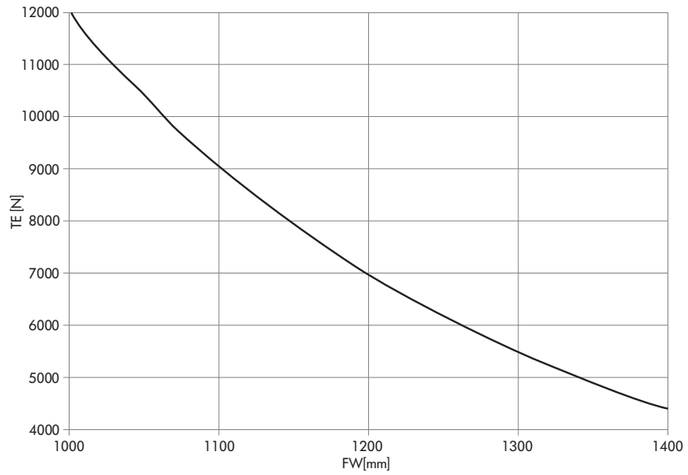
Electrical data for 1-phase asynchronous motor

P_N [W]	np	U_N [V]	I_N [A]	cosφ	η [%]	J_R [$kgcm^2$]	I_S/I_N	M_S/M_N	M_B/M_N	M_P/M_N	R_M [Ω]	$U_{SH\sim}$ [V DC]	C_R [µF]
250	4	1360	2.4	0.97	0.5	7.2	1.25	1.1	1.1	1.1	12.7	44.3	12

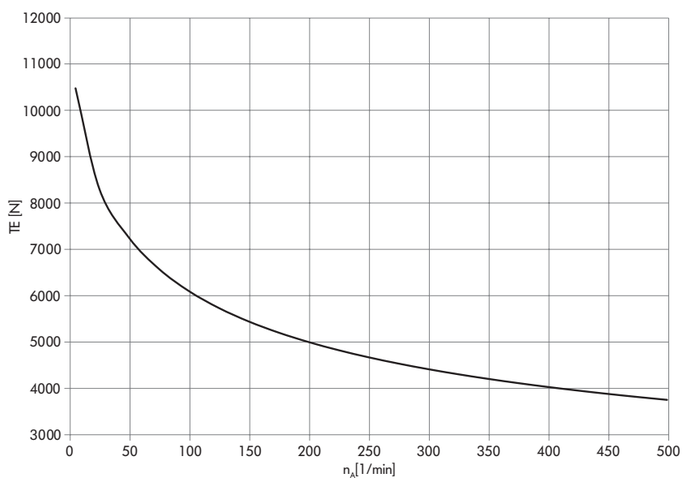
P_N = Rated power
np = Number of poles
U_N = Rated voltage
I_N = Rated current
cosφ = Power factor
η = Efficiency
J_R = Rotor moment of inertia
I_S/I_N = Ratio of startup current - rated current
M_S/M_N = Ratio of startup torque - rated torque
M_B/M_N = Ratio of pull-out torque - rated torque
M_P/M_N = Ratio of pull-up torque - rated torque
R_M = Branch resistance
$U_{SH\sim}$ = Heater voltage for DC units
C_R = Capacitor size

Belt tension diagrams

Belt tension depending on drum width



Belt tension depending on rated speed of shell

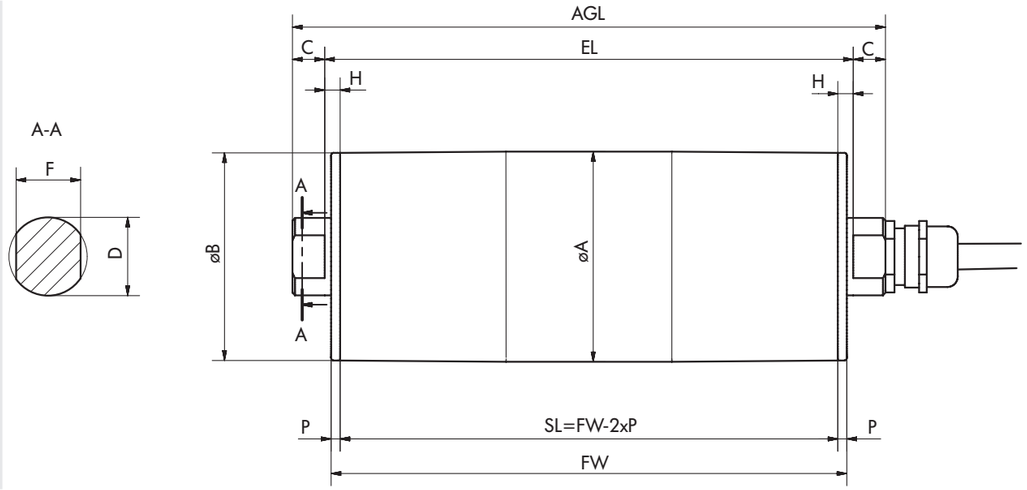


Note: The correct value for the maximum permissible belt tension is determined from the speed of the drum motor. When selecting the motor, also check whether the maximum permissible TE value fits the desired drum width (FW).

TE = Belt tension
n_A = Shell rated speed
FW = Drum width

Dimensions

Drum motor



Type	A [mm]	B [mm]	C [mm]	D [mm]	F [mm]	H [mm]	P [mm]	SL [mm]	EL [mm]	AGL [mm]
DM 0113 crowned	113	112	25	30	25	10	3.5	FW – 7	FW + 13	FW + 63
	113	112	25	25*	20	10	3.5	FW – 7	FW + 13	FW + 63
DM 0113 cylindrical	112	112	25	30	25	10	3.5	FW – 7	FW + 13	FW + 63
	112	112	25	25*	20	10	3.5	FW – 7	FW + 13	FW + 63
DM 0113 cylindrical + key	113	113	25	30	25	10	3.5	FW – 7	FW + 13	FW + 63
	113	113	25	25*	20	10	3.5	FW – 7	FW + 13	FW + 63

* Available from Q4/2018

Cable overview

Cable connections

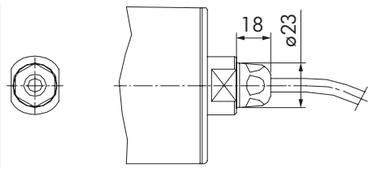


Fig.: Straight hygienic connector, IP69k stainless steel

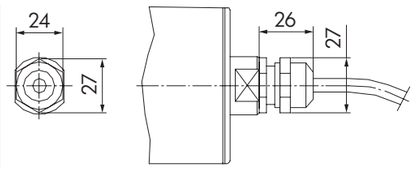


Fig.: Straight connector, brass or stainless steel

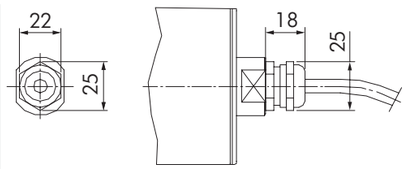


Fig.: Straight EMC connector, brass or stainless steel

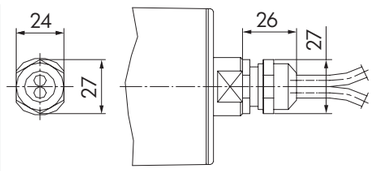


Fig.: Straight connector for encoder, brass or stainless steel

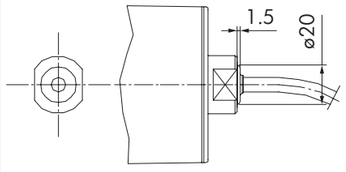


Fig.: Straight connector, shaft cap made of PU

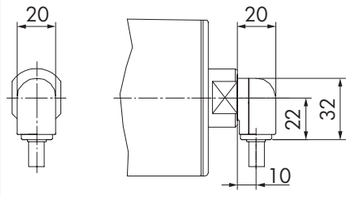


Fig.: Elbow connector, Technopolymer

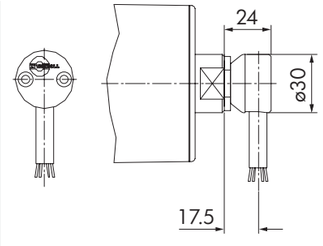


Fig.: Elbow connector, stainless steel, also for encoders

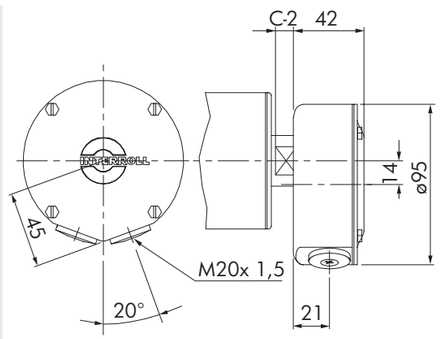


Fig.: Terminal box, stainless steel

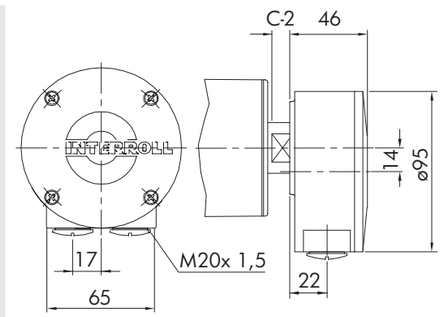


Fig.: Terminal box, aluminum

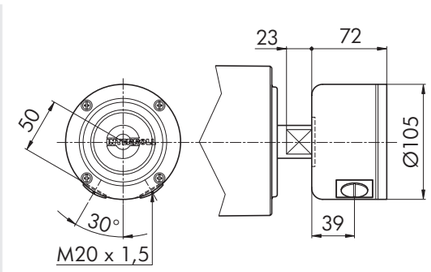


Fig.: DM 0113, terminal box, technopolymer

The minimum length of the drum motor with options increases as follows:

Brake:	Min. FW + 59 mm
Feedback device:	Min. FW + 50 mm
Cable specification:	page 43
Available cable lengths:	1 m, 3 m, 5 m, 10 m