

IndraDrive for Linear Motion Systems

R310EN 2730 (2007.07)

The Drive & Control Company

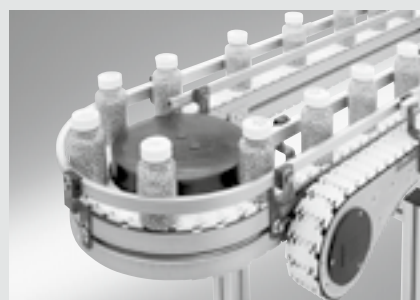
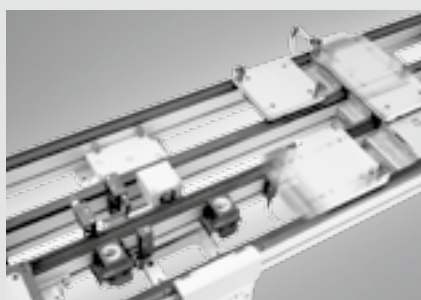
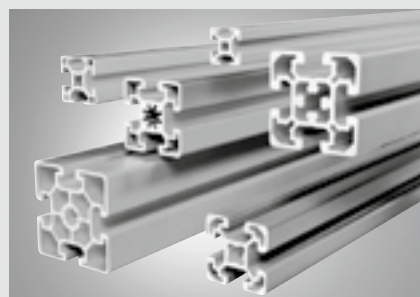
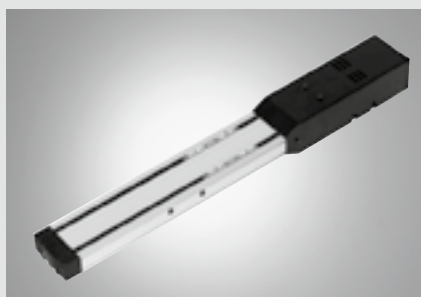
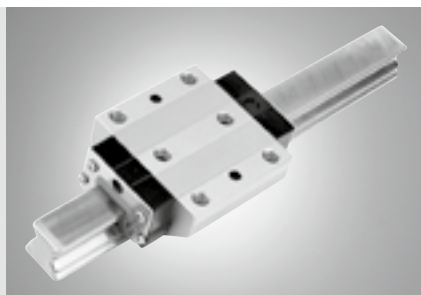
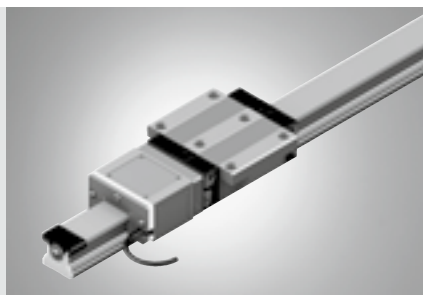


Linear Motion and Assembly Technologies

Ball Rail Systems
Roller Rail Systems
Linear Bushings and Shafts

Precision Ball Screw Assemblies
Linear Motion Systems

Basic Mechanical Elements
Manual Production Systems
Transfer Systems



IndraDrive for Linear Motion Systems

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Product Overview

Servo controller IndraDrive C

The intelligent IndraDrive C controller is a compact, versatile servo drive system that can be used to control motion sequences in nearly all areas of automation.

IndraDrive C controllers comprise all the necessary supply and control electronics and are available in several different power ratings.

The HCS power unit and the CSB/CSH control unit are supplied as separate components. A control unit can be integrated into a power unit with any desired power rating, which greatly simplifies warehousing and inventory management.

Tailor-made functionality:

- All standard functions are provided in the basic package.
- Add-on functions can be incorporated as required.
- Industry-specific functionalities available to match different technologies.

Optional safety technology S1

Control units with S1 safety technology offer all the available safety functions, including safe motion and safe absolute position. This safety is assured by two redundant diversity processor systems which perform all relevant calculations separately and monitor each other. The two-channel selection of the required safety function can be executed in different ways.

Servo motor MSK

The servo motors we use for our linear motion systems have an absolute measuring system (Hiperface).

This eliminates the need to perform a homing cycle. The motors are available with or without a brake. The motor shaft is smooth, which is standard practice in servo technology.

Pre-assembled motor and feedback cables

The motor and feedback cables are pre-assembled to facilitate installation.

Start-up software IndraWorks

Simple and user-friendly, Rexroth IndraWorks is the ideal engineering environment for all Rexroth electrical control and drive systems.

Documentation

The complete documentation is supplied on DVD, which saves both costs and space.

IndraDrive servo controller

- Power unit HCS and
- Control unit CSB/CSH



Servo motor MSK



Start-up software IndraWorks Drive



CSB/CSH control unit for integration in the HCS power unit



Pre-assembled motor and feedback cables

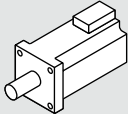


Optional safety technology

Motor-Controller Selection Data

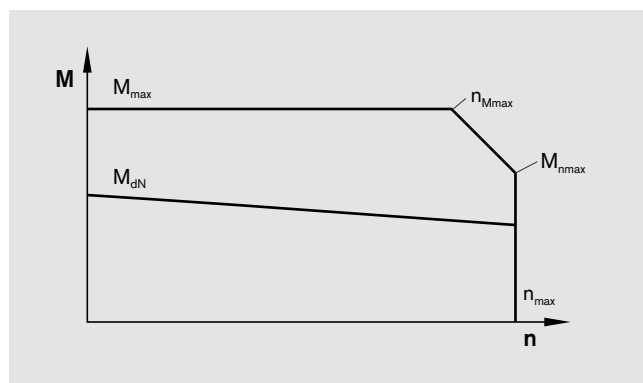
Servo drives with rotary motors

- 400 ms acceleration time
- 60 Kelvin overtemperature
- PWM 4 kHz
- 3x400V –5%, data for natural convection cooling

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Comparable MKD...	Motor mount compatible	Motor MSK Digital servo motor	Power section: Converter for 1 axis with direct mains connection via mains filter	$n_{\max}$	$n_{M\max}$	M_{dN}	$M_{\max}$	$M_{n\max}$	J_M	J_{Br}	M_{Br}	m_M	m_{Br}
				(min ⁻¹)	(min ⁻¹)	(Nm)	(Nm)	(Nm)	(kgm ²)	(kgm ²)	(Nm)	(kg)	(kg)
25	Yes	MSK030C-0900	HCS02.1E-W0012	9000	9000	0.8	4	4	0.00003	0.000007	1	2.10	0.25
41	Yes	MSK040C-0600	HCS02.1E-W0012	5600	4043	2.4*)	7.7	3.9	0.00014	0.000023	4	3.60	0.32
-	No	MSK050C-0600	HCS02.1E-W0028	5700	4332	5	15	8.2	0.00033	0.000107	5	5.40	0.70
71	No	MSK060C-0600	HCS02.1E-W0054	5200	3187	8	24	11.2	0.00080	0.000055	10	8.40	0.45
71	Yes	MSK061C-0600	HCS02.1E-W0028	4800	4150	7.6*)	26.7	15.2	0.00075	0.000059	10	8.40	0.40
-	No	MSK070E-0450	HCS02.1E-W0070	3900	3482	23*)	57.5	40.1	0.00458	0.000300	23	16.20	1.60
90	Yes	MSK076C-0450	HCS02.1E-W0054	4500	3510	11.8*)	42.9	20.2	0.00430	0.00036	11	14.00	1.10

*) limited by continuous current of controller

- $n_{\max}$ = maximum usable motor speed
 $n_{M\max}$ = usable speed at maximum torque
 M_{dN} = continuous torque at standstill
 $M_{\max}$ = maximum torque usable up to $n_{M\max}$ and up to 400 ms
 $M_{n\max}$ = maximum torque at maximum usable speed
 J_M = rotor moment of inertia of motor
 J_{Br} = rotor moment of inertia of brake
 M_{Br} = holding torque of holding brake when switched off
 m_M = mass of motor
 m_{Br} = mass of brake



Standard motors for linear motion technology, with multturn Hiperface, with and without brake (absolute measuring system)

Without holding brake	
Part number	Motor
R347108403	MSK030C-0900-NN-M1-UG0-NNNN
R347108603	MSK040C-0600-NN-M1-UG0-NNNN
R347108803	MSK050C-0600-NN-M1-UG0-NNNN
R347109003	MSK060C-0600-NN-M1-UG0-NNNN
R347109403	MSK061C-0600-NN-M1-UG0-NNNN
R347109203	MSK076C-0450-NN-M1-UG0-NNNN

With holding brake	
Part number	Motor
R347108503	MSK030C-0900-NN-M1-UG1-NNNN
R347108703	MSK040C-0600-NN-M1-UG1-NNNN
R347108903	MSK050C-0600-NN-M1-UG1-NNNN
R347109103	MSK060C-0600-NN-M1-UG1-NNNN
R347109503	MSK061C-0600-NN-M1-UG1-NNNN
R347109303	MSK076C-0450-NN-M1-UG1-NNNN

Motor Cable Sets

Technical data

	Power cable		Feedback cable
	R1130-001-17	R1130-001-15	
Diameter (mm)	12.0 ±0.5	12.2 ±0.5	8.8 ±0.3
Minimum bending radius			
– for fixed installation	60.0	61.0	44.0
– for flexing installation	90.0	91.5	66.0
Spec. cable weight (kg/m)	0.225	0.245	0.11

Chemical properties:

Resistant to most mineral oils and greases, resistant to hydrolysis, silicon-free, halogen-free.

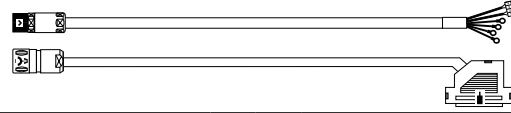
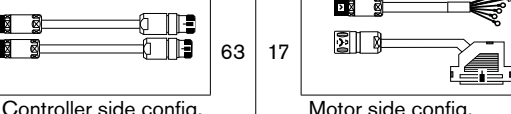
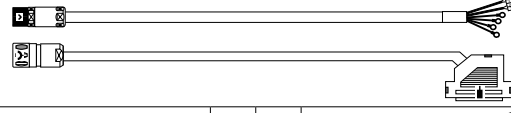
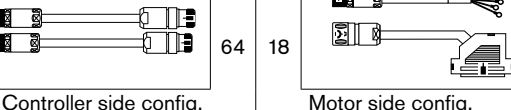
Cable surface:

Low-adhesion, prevents sticking in cable drag chains.

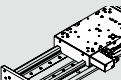
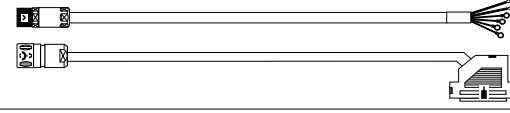
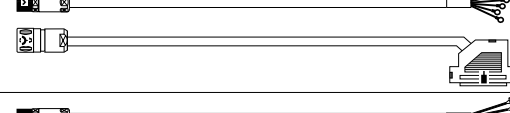
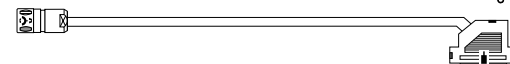
Protection class, when properly installed: IP 65

- Permissible ambient temperature in operation: –20 °C to +40 °C
- Maximum cable length: 75 m
- Power and feedback cables fully shielded

Ordering code for MSK cable sets

	Part number Cable set	Cable set options Cable pre-assembly				For converter	
MSK030 MSK040 MSK050 MSK060 MSK061 MSK076	R113000117	Motor side				Controller side	
		17				19	HCS02 12/28A
						18	HCS02 54/70A
		63	17				
		Controller side config.			Motor side config.		
MSK070	R113000115	Motor side					
		18				26	HCS02 54/70A
							
		64	18				
		Controller side config.			Motor side config.		

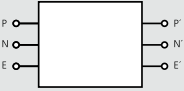
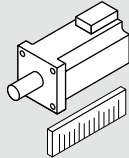
Ordering code for TKL cable sets

Ordering code for TKL cable sets		Cable set options			For converter
	Part number Cable set	Cable pre-assembly		Controller side	
		Motor side			
MLP040	R113000118	01		10	HCS02 12/28A
MLP070	R113000126	02		11	HCS02 54/70A
				12	HCS03 150A
MLP100	R113000141	03		12	HCS03 150A

Note: MKL, LKL, and CKL linear modules come complete with cable sets.

There is no need to order motor cable sets separately.

IndraDrive Components and Ordering Data

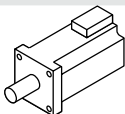
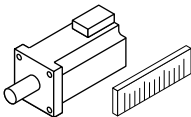
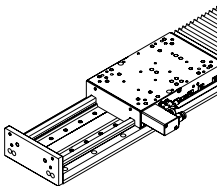
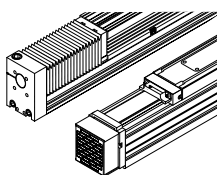
Power supply (mains filter, brake resistor)		Power unit			
		 			
Connection voltage, rated current	Mains filter / choke / brake resistor Part number	For motor	Power unit type	Power unit with connection accessories Part number	
1x230V 10A	Mains filter R347700106	MSK030C MSK040C	HCS02.1E-W0012-A-03-NNNN	R113001561	
3x400V 7A	Mains filter R113089615				
3x400V 16A	Mains filter R113089616		MSK050C MLP040A MLP040B LDxxx LMxxx-x	R113001562	
3x400V 30A	Mains filter R113089617	MSK060C MSK076C	HCS02.1E-W0054-A-03-NNNN	R113001563	
		MSK070E	HCS02.1E-W0070-A-03-NNNN	R113001564	
3x400V 30 ampere or application-dependent!	e.g. mains filter R113089617 + brake resistor R113089680 or application-dependent!	MLP070A MLP070B MLP100A	HCS03.1E-W0070-A-05-NNBV	R113001565	
3x400V 106 ampere or application-dependent!	e.g. mains filter with integrated mains choke HNK R113089688 + brake resistor R113089680 or application-dependent!	MLP100B MLP100C	HCS03.1E-W0150-A-05-NNBV	R113001566	

Other control units available on request

Control unit



For motor

For motor	Part number	Standard R1130015..				Optional safety technology S1			
	Encoder interface	Type	Analog	Profibus	Sercos II	Parallel	Profibus	Sercos	Parallel
	ENS for MSK		R...39	R...40	R...42	R...48	R...41	R...43	R...49
	ENS + EN2 for MSK + encoder ~1Vpp		R...50	R...51	R...52	R...53	R...54	R...44	R...55
	EN2 for TKL with ENDat 2.1 TKL with ~1Vpp		R...50	R...51	R...52	R...53	-	-	-
	CKL (parameter input by customer)		R...56	R...57	R...58	R...59	-	-	-
	EN2 + EN1 for LKL MKL		R...56	R...57	R...58	R...59	-	-	-

Software and documentation

Start-up software
IndraWorks DInterface cable for
PC controllerDocumen-
tation DVD

R113540030

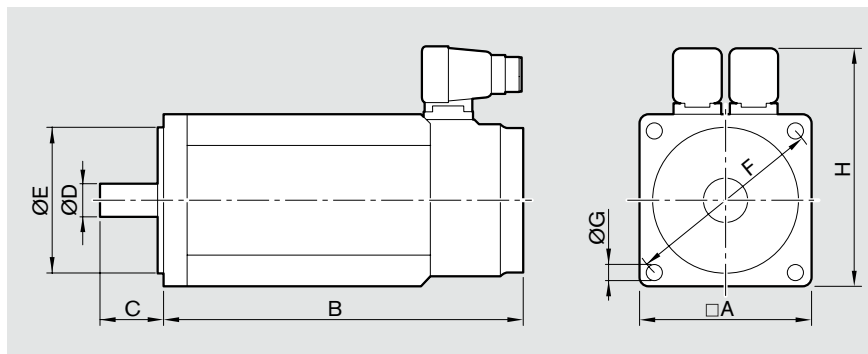
R113069541

R113089543

Dimensions

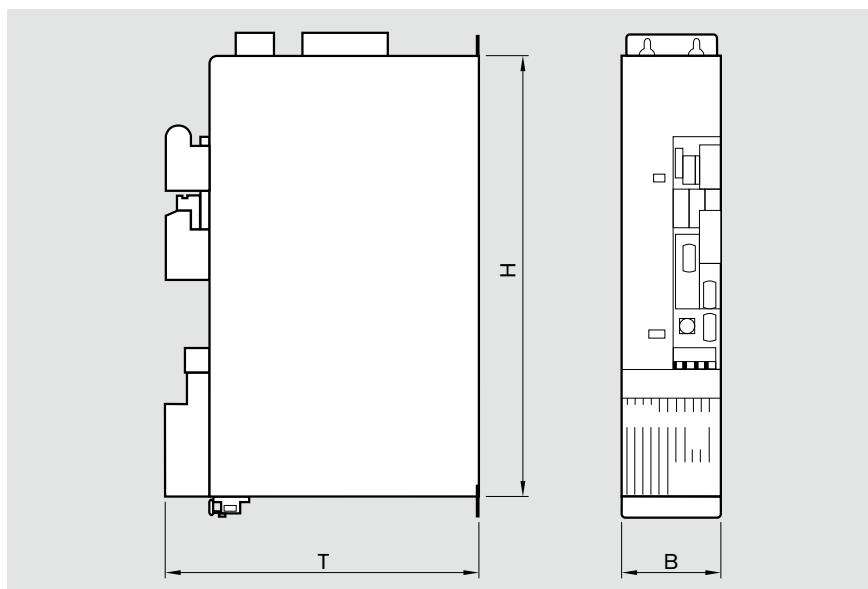
Motor dimensions

Motor	Dimensions (mm)								
	A	B with brake	B w/o brake	C	Ø D	Ø E	Ø F	Ø G	H
MSK030C-0900	54.0	213.0	188.0	20.0	9.0	40.0	63.0	4.5	98.5
MSK040C-0600	82.0	215.5	185.5	30.0	14.0	50.0	95.0	6.6	124.5
MSK050C-0600	98.0	233.0	203.0	40.0	19.0	95.0	115.0	9.0	134.5
MSK060C-0600	116.0	259.0	226.0	50.0	24.0	95.0	130.0	9.0	156.0
MSK061C-0600	116.0	264.0		40.0	19.0	95.0	130.0	9.0	156.0
MSK070E-0450	140.0	298.0		58.0	32.0	130.0	165.0	11.0	202.0
MSK076C-0450	140.0	292.5		50.0	24.0	110.0	165.0	11.0	180.0



Controller dimensions

Controller dimensions	Converter					
	HCS02.1E-W0012	HCS02.1E-W0028	HCS02.1E-W0054	HCS02.1E-W0070	HCS03.1E-W0070	HCS03.1E-W0150
Width W (mm)	65.0	65.0	105.0	105.0	125.0	225.0
Height H (mm)	290.0	352.0			440	
Depth D (mm)	265.0				315	
Weight (kg)	2.9	3.8	6.7	6.8	13	20



Order Example

**Motor with motor cable set and
servo controller system for two axes**

Qty	Description	Part number
2	MSK050C	R3471 089 03 (can also be selected as an axis option)
2	Cable set, length 5 m (pre-assembled for MSK and HCS02-0012/0028)	R1130 001 17 /17/19 Length 5 m
1	Mains filter 7A, 3x400V AC	R1130 896 15
2	Servo controller HCS02.1E-W0028	R1130 015 62
2	Control unit BASIC Profibus DP	R1130 015 40
1	Software IndraWorks Drive	R1135 400 30
1	Documentation on DVD	R1130 895 43
1	Interface cable	R1130 695 41

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Your sales partner

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