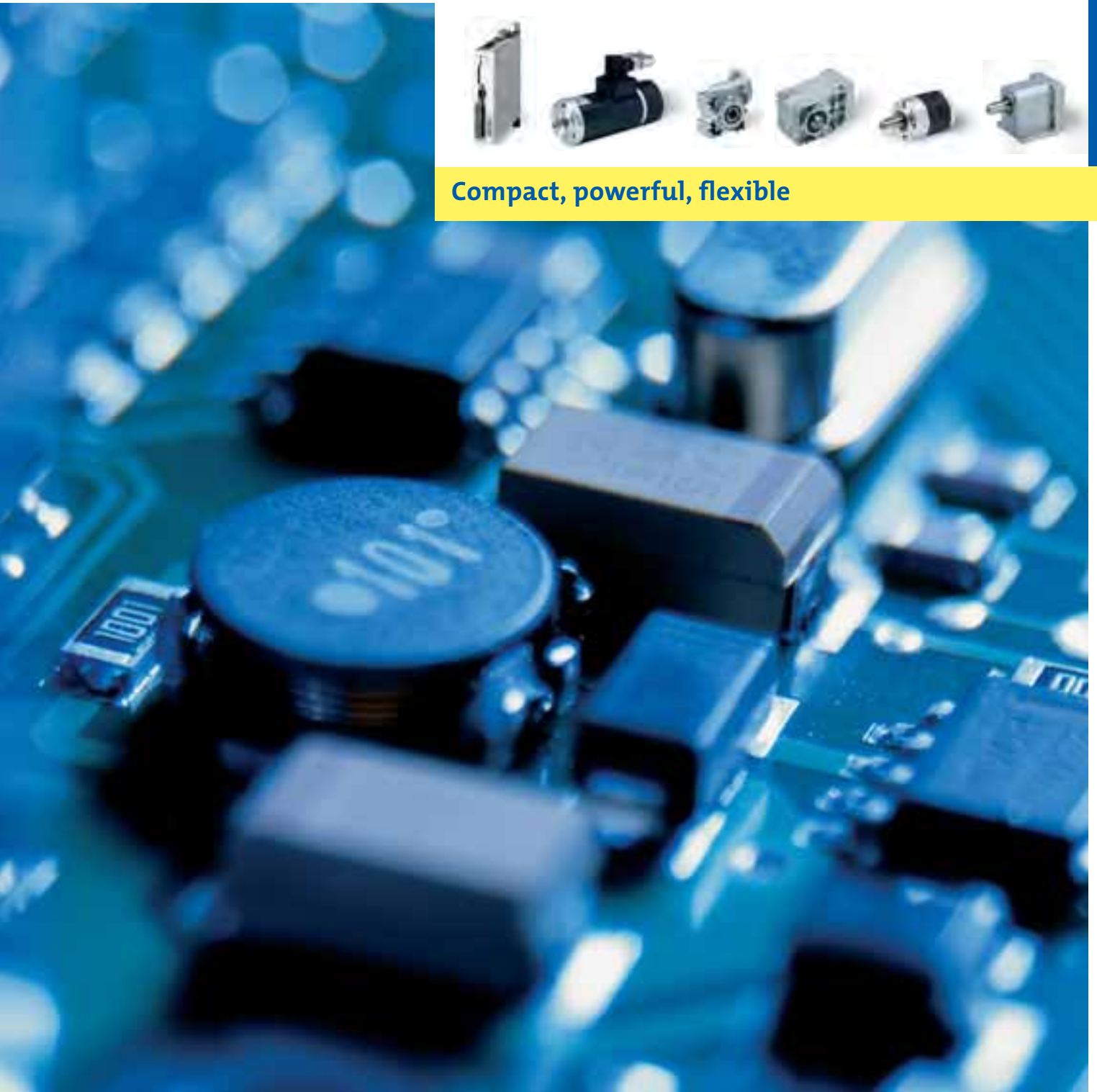


Servo Drives 930



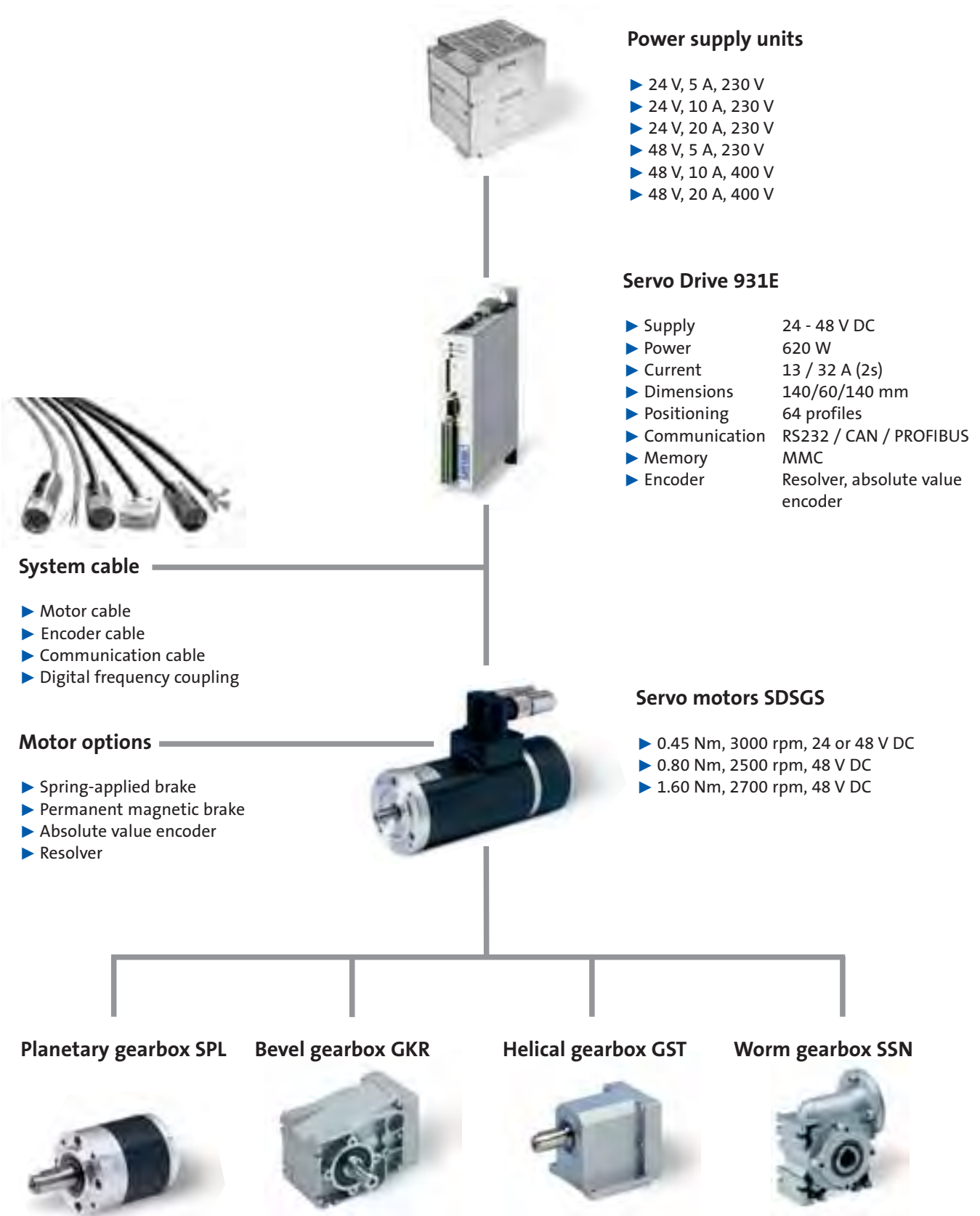
Compact, powerful, flexible



Lenze



System overview of Servo Drives 930





General information

Type code

Type code Servo Drives 930

931ECK10 2.0 x.x.x.x.x

Product range

930

Size / Power range

1 to 600 W

Design

E- Built-in unit for IP 20 control cabinet

Communication

C- CAN bus integrated

P- PROFIBUS integrated

Voltage class

K- Design for extra-low voltage

Options

1- Inputs and outputs

Installation

0- Control cabinet installation

Hardware version

2.0 series, version 2.0

Software version



System cable type code Servo Drives 930

931EKR01UOS**Inverter type**

931

Series

E- Built-in unit for IP 20 control cabinet

Type

K- Cable

Application

R- Resolver

L- Power

C- CAN bus

S- Serial

E- Encoder

K- Digital frequency coupling

X- Not described

Length

01- <1 m

02- 1-2 m

03- 2-3 m

04- 3-4 m

05- 4-5 m

XX- Not described

Assignment

U- Universal

Cable end 1

O- Open end

S- Plug

B- Socket

X- Not described

Cable end 2

O- Open end

S- Plug

B- Socket

A- Terminating resistor

X- Not described



General information

Type code

Motor series SDS type code

SDSGSRS056-22

Product group _____

S- Small drives

Type of current _____

D- Three-phase AC current

Ventilation _____

S- Naturally ventilated

Design _____

G- Smooth housing

Type of machine _____

S- Synchronous machine

Built-on accessories design _____

RS- Resolver

AG- Absolute value encoder

BA- Brake and absolute value encoder

BS- Brake and resolver

Motor frame size _____

Axis height as per standard, e.g. 056 = IEC56

Overall length _____

2- M, medium

Number of pole pairs _____

2- 4 pole



Type code for geared motors

SSN40-2GVAR-056C22

Product group

- G- Gearbox
- S- Small drive

Product range

- KR- Bevel gearbox
- PL- Planetary gearbox
- SN- Worm gearbox
- ST- Helical gearbox

Size

- Helical gearbox -03, 04, 05
- Bevel gearbox -03, 04, 05
- Worm gearbox 31, 40
- Planetary gearbox -52, 62, 81, 12

Number of stages

- 1- Single-stage
- 2- Two-stage
- 3- Three-stage

Drive-end version

- G- Synchronous motor model line SDS

Output-end version

Shaft design

- V - solid shaft
- D- Double shaft
- H- Hollow shaft

Housing version

- A- Foot and centering
- C- Without foot, with centering

Output flange

- L- Round flange with threaded holes
- R- Without flange
- K- Round flange with through hole

Motor frame size

Axis height as per standard, e.g. 056 = IEC56

Design

- C- Compact motor with Lenze mounting flange
- N- Standard motor with IEC mounting flange

Overall length

- 2- M, medium

Number of pole pairs

- 2- 4 pole



General information

Mounting positions

Mounting position (A-F) and position of the system blocks (1-6)

SSN□□-1G□□		Solid shaft: 3, 5, 8		Flange: 3, 5		Electrical connection: 2, 3, 4, 5					
A		B		C		D		E		F	
Shaft-flange position											

Helical geared motors GST

GST□□-□G□□		Electrical connection: 2, 3, 4, 5									
A		B		C		D		E		F	

Helical geared motors GKR

GKR□□-2G□□		Solid shaft: 3, 5, 3+5 Hollow shaft: 0 Hollow shaft with shrink disc: 3, 5		Flange: 3, 5, 3+5 Without flange: 0		Electrical connection: 2, 3, 4, 5					
A		B		C		D		E		F	



Designations used in the catalogue:

α Angle of action of radial force

c Load capacity of gearboxes/geared motors

d_w [mm] Pitch-circle diameter of the transmission element

cos φ Power factor of the motor

cos φ_N Power factor of asynchronous motors

F_a [N] Axial force applied

F_{a perm} [N] Permissible axial force

F_{a Tab} [N] Tabular axial force value

f_{ch} [kHz] Switching frequency

f₀ [Hz] Field frequency

F_I Mass acceleration factor

f_{max} [Hz] Maximum frequency set

f_N [Hz] Rated frequency

F_r [N] Radial force applied

F_{r Tab} [N] Tabular radial force value

F_{r perm} [N] Permissible radial force

f_w Additional load factor of the radial force applied

f _{α} Effective direction factor of the radial force applied

f_z Additional radial force factor of the transmission element

i Ratio

φ Ratio step

η Mechanical efficiency

I₀ [A] Continuous standstill current

I_A [A] Current at motor start-up

I_{max} [A] Maximum output current

I_N [A] Rated current

I_{mains} [A] Rated mains current

J_{ext} [kgm²] Moment of inertia of the driven machine reduced to the motor shaft

J_{load} [kgm²] Moment of inertia of the machine under load

J_{mot} [kgm²] Moment of inertia of the motor

J_A [kgm²] Moment of inertia of the drive reduced to the motor shaft

J_B [kgm²] Moment of inertia of brake

k Application factor (following DIN 3990)

L [mH] Inductance

m [kg] Mass

M₀ [Nm] Continuous standstill torque

M₁ [Nm] Drive torque

M₂ [Nm] Output torque

M_r [Nm] Rated torque

M_A [Nm] Starting torque of the motor

M_B [Nm] Holding torque of the brake

M_{cont} [Nm] Constant torque

M_{stall} [Nm] Stalling torque of the motor

M_I Maximum torque factor

M_{max} [Nm] Maximum torque

M_{perm} [Nm] Permissible torque

n₁ [rpm] Input speed

n₂ [rpm] Output speed

n_r [rpm] Rated speed

n_{max} [rpm] Maximum speed

P₁ [kW] Input power

P₂ [kW] Output power

P_r [kW] Rated power

P_V [kW] Power loss of inverter

R [Ω] Resistance

S_r [kW] Output power of inverter

TU [$^{\circ}$ C] Ambient operating temperature

UG [V] DC-bus voltage

U_r [V] Rated voltage

U_{mains} [V] Mains voltage

Ū [kV] Voltage peak

IP International protection code

IEC International Electrotechnical Commission

DIN Deutsches Institut für Normung (German institute governing standards)

VDE Verband deutscher Elektrotechniker (Association of German Electrotechnical Engineers)

USDA United States Department of Agriculture

NEMA National Electrical Manufacturers Association

AC Alternating current/voltage

DC Direct current/voltage

EMC Electromagnetic compatibility

EN European standard

CE Communauté Européene

IM International Mounting Code



Technical data on Servo Drives 930

Supply voltage				
Rated voltage	24 V DC		48 V DC	
Permissible range	19.2 V DC - 0% ... 57.6 V DC + 0%			
Supply current at rated power	approximately 13 A			
Max. supply current	approximately 35 A			
Rated power	310 W		620 W	
Efficiency	up to 95%			
PWM frequency (switchable)	10 kHz	20 kHz	10 kHz	20 kHz
Rated output current	0 ... 13 A _{eff}	0 ... 10 A _{eff}	0 ... 13 A _{eff}	0 ... 10 A _{eff}
Peak output current for 2 s	32 A _{eff}	25 A _{eff}	32 A _{eff}	25 A _{eff}
Rated output voltage	0 ... 14 V _{eff}		0 ... 27 V _{eff}	
Output frequency	0 ... 200 Hz			
Control voltage ¹⁾	24 V DC ±20%			
Max. control current	min. 0.25 A (only control section) max. 1.5 A (all outputs connected)			
Switching threshold of brake chopper				
On	approximately 63 V DC			
Off	approximately 60 V DC			
Switching threshold for overvoltage monitoring	approximately 70 V DC			
Internal brake resistor				
Resistance R	17 Ω			
Continuous power P _N	10 W			
Peak power P _{Puls}	200 W for 50 ms			
External brake resistor				
Resistance R	5 Ω			
Continuous power P _N	10 ... 600 W			
Motor holding brake	24 V / 1 A			
Positioning range	± 2 ¹⁹ revolutions			
Storable positions	64			
Scanning times of the control loops				
Current controller	100 μs			
Speed controller	200 μs			
Position controller	400 μs			

¹⁾ Observe the minimum voltage of the brake!



Technical data on Servo Drives 930

Conformity	CE	Low Voltage Directive 73/23/EEC
Regulations	EN 61800-3	Interference level B
Climatic conditions	Air humidity max. 90% without condensation	
Cooling	Passive cooling via housing surface and rear panel	
Permissible temperature range		
Transport	-25 °C ... +70 °C	
Storage	-25 °C ... +70 °C	
Operation	0 °C ... +50 °C	above +40 °C reduce power by 20 W/°C
Permissible site altitude	0 ... 1000 m amsl	above 1000 m amsl reduce the rated output current by 5%/1000 m
Mounting position	vertical	
Installation clearance		
Above/below	≥ 100 mm	
Lateral	Can be lined up without any clearance	
Monitoring	Overvoltage / undervoltage in DC bus, overcurrent or short circuit of the output stage, temperature of motor and output stage, I ² t-monitoring of the motor, encoder monitoring	
Enclosure	IP 20	
Inputs	6 digital inputs, 2 analog inputs (can be set via software)	
Outputs	2 digital outputs, 2 analog outputs (can be set via software)	
Bus system	CAN (DS301, DSP402), PROFIBUS	
Memory cards	Multi Media Card	



X5 inputs and outputs

Pin-no.	Signal	function		Specification
		Lenze	can alternatively be set via SDC	
1	+AIN0 (DIN0)	Analog input 0 Differential (speed setpoint, current setpoint)	DIN0	Input voltage -10 V ... +10 V
2	-AIN0 (DIN1)		DIN1	Overvoltage protection -30 V ... +30 V
3	+AIN1 (DIN2)	Analog input 1 Differential	DIN2	Input impedance > 20 kΩ
4	-AIN1 (DIN3)		DIN3	Resolution 12 bit
5	+AMON0	Analog monitors Output of internal values (current, speed, etc.)		Offset error < ± 50 mV
6	+AMON1			Gain error < 5%
7	GND	Reference potential for pin 1 ... 6, pin 8 ... 16		Limit frequency ~ 1 kHz
8	DIN4	Digital input 4		Output signal 0 V ... 10 V, max. 2 mA
9	DIN5	Digital input 5		
10	DIN6	Digital input 6		
11	DIN7	Digital input 7		
12	DIN8	Digital input 8		
13	DIN9	Digital input 9 (controller enable / delete error)		
14	DOUT0	Digital output 0 (ready for operation)		
15	DOUT1	Digital output 1		
16	DOUT2	Digital output 2		

Connection plug

Set of connection plugs	Rated current	application / Max. cross-section
X3	Motor connection	16 A / 2.5 mm ²
X2	Voltage supply	16 A / 2.5 mm ²
X5	Inputs and outputs	1 A / 1.5 mm ²

Motor connection system cables

Motor - servo inverter		
Connection to servo inverter	Length [m]	Connection to motor
X3 (U, V, W, PE)	2.5	socket 6-pole
	5	
Resolver feedback		
Connection to servo inverter	Length [m]	Connection to motor
X7 plug Sub-D, 9-pole	2.5	socket M23 12-pole
	5	
Absolute value encoder feedback		
Connection to servo inverter	Length [m]	Connection to motor
X7 plug Sub-D, 9-pole	2.5	socket M23 12-pole
	5	



Communication system cables

CAN system cable		
CAN input	Length [m]	CAN output
X4.1 Plug RJ 45	3	X4.2 Plug RJ 45

Serial null modem connection RS232		
Connection to servo inverter	Length [m]	Connection to PC
X1 Socket Sub-D, 9-pole	1.8	socket Sub-D, 9-pole

Power supply units

Technical data on the power supply units			
Secondary		Primary	
DC 24 V (DC 22.5 ... 28.5 V)	5 A	AC 85 V - 0% ... 264 V + 0% 45 Hz - 0% ... 65 Hz + 0%	approximately 1.6 A (AC 120 V) approximately 0.84 A (AC 230 V)
	10 A		approximately 2.34 A (AC 120 V) approximately 1.2 A (AC 230 V)
	20 A		approximately 4.76 A (AC 120 V) approximately 2.3 A (AC 230 V)
DC 48 V (DC 40 ... 56 V)	5 A	AC 85 V - 0% ... 264 V + 0% 45 Hz - 0% ... 65 Hz + 0%	approximately 2.2 A (AC 120 V) approximately 1.2 A (AC 230 V)
	10 A		approximately 3 x 1.2 A (AC 400 V) approximately 3 x 1.0 A (AC 480 V)
	20 A		approximately 3 x 2.3 A (AC 400 V) approximately 3 x 1.9 A (AC 480 V)

Memory cards

Memory cards (on request)	
Format	Capacity
MMC (Multi Media Card)	64 MB

Interface description key page 16

Pos.	Description	
	931ECK10 CAN-BUS	931EPK10 PROFIBUS
X1	RS232	
X2	Voltage supply	
X3	Motor connection	
X4.1 / X4.2	CAN interface	PROFIBUS interface 1)
X5	Digital inputs and outputs / Analog inputs and outputs	
X6	Slot for multimedia memory card	
X7	Resolver input	
X8	Sin/cos encoder input	
X10	Digital frequency interface	

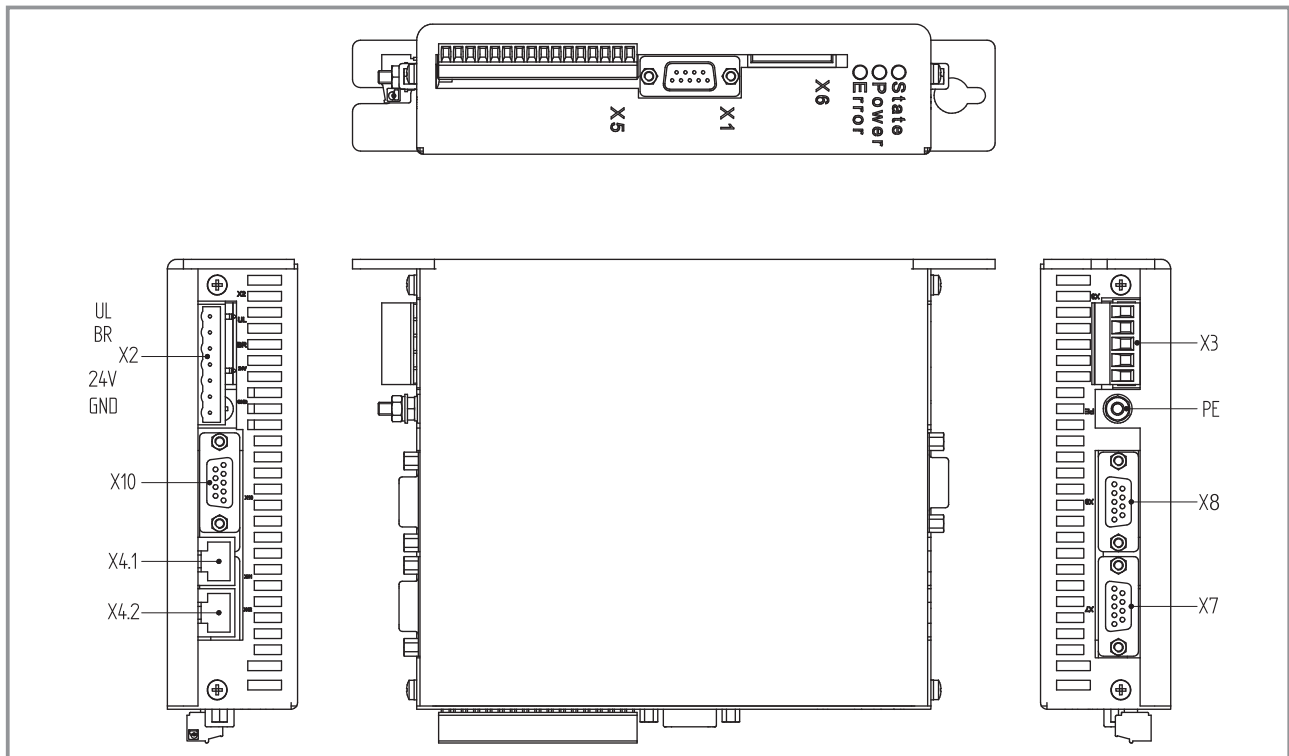
¹⁾ PROFIBUS plug with Sub-D-9-pole as per IEC61158 / IEC61784



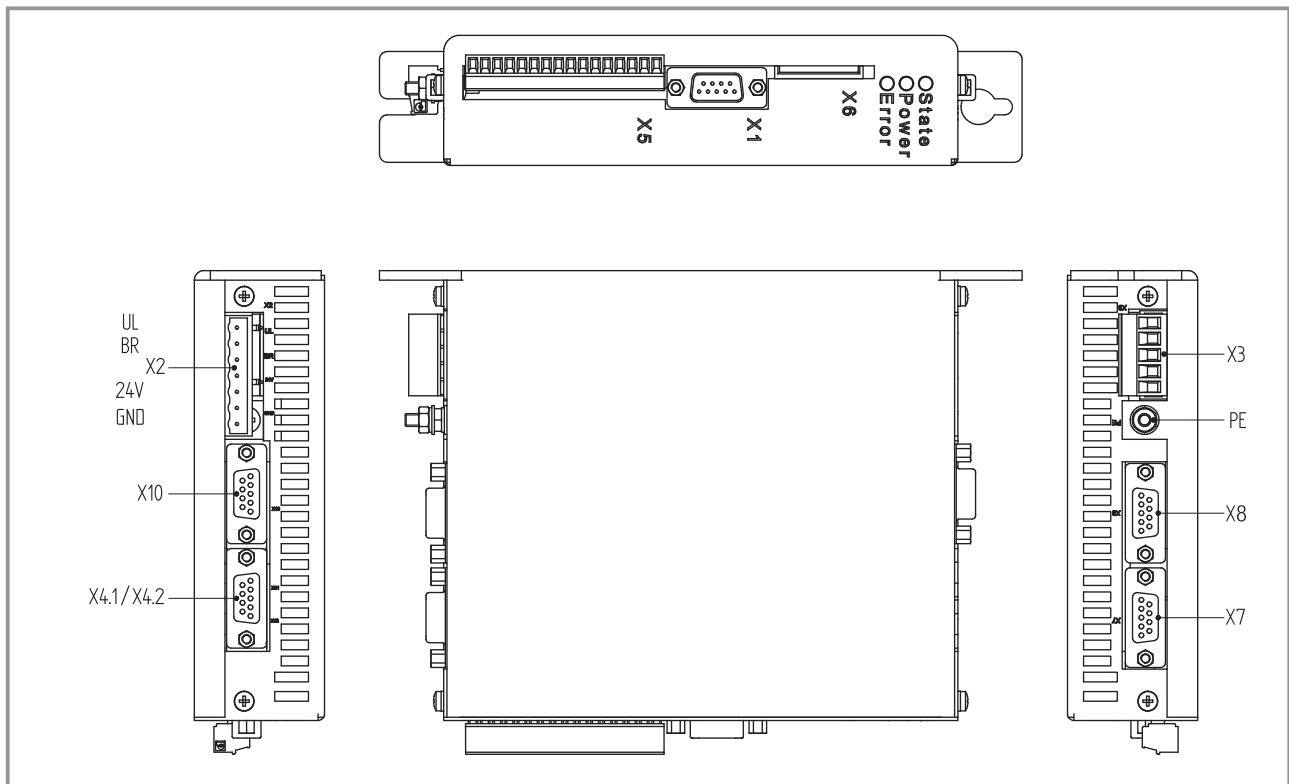
General information

Electronics technology

Interface description



931ECK10 CAN bus communication (see page 15 for key)



931EPK10 PROFIBUS communication (see page 15 for key)



Technical data on Small Drives Control



The Small Drives Control application allows parameter setting of the servo position controller 931E.

The parameterisation software Lenze Small Drives Control allows optimum adjustment of the servo position controller 931E to the respective application. The parameter setting application offers the following performance features:

- ▶ Parameter setting of the servo position controller 931E
- ▶ Setting of all parameters via PC
- ▶ Display of status and operating values
- ▶ Loading of new firmware versions
- ▶ Loading and saving of parameter sets
- ▶ Printing of parameter sets
- ▶ Offline parameter setting
- ▶ Oscilloscope function
- ▶ Language support: German, English, French
- ▶ Free of charge software available via www.Lenze.de



Technical data on servo motors

Motor type	SDSGS__035-22	SDSGS__035-22	SDSGS__047-22	SDSGS__056-22
Rated power	140 W	140 W	210 W	450 W
Rated torque	0.45 Nm	0.45 Nm	0.8 Nm	1.6 Nm
Rated current	8.4 A	4.0 A	6.2 A	12.5 A
Rated voltage	13 V	30 V	30 V	30 V
Rated frequency	100 Hz	100 Hz	83 Hz	90 Hz
Rated speed	3000 rpm	3000 rpm	2500 rpm	2700 rpm
Maximum speed (mech.)	6000 rpm	6000 rpm	6000 rpm	6000 rpm
Standstill torque	0.55 Nm	0.55 Nm	1.0 Nm	1.9 Nm
Continuous standstill current	9.5 A	4.4 A	7.2 A	13.6 A
Maximum current (demagnetisation current)	86 A	40 A	41 A	146 A
Maximum torque (mech.)	3.2 Nm	3.5 Nm	7.4 Nm	13.7 Nm
Speed constant [V/1000 r/min]	3.7 V/1000 rpm	7.5 V/1000 rpm	8.7 V/1000 rpm	8.7 V/1000 rpm
Torque constant [Nm/A]	0.058 Nm/A	0.124 Nm/A	0.14 Nm/A	0.14 Nm/A
R _{UV} [Ω]	0.22 W	1.10 W	0.61 W	0.19 W
L phase	0.18 mH	0.585 mH	0.846 mH	0.280 mH
Moment of inertia	0.293 kgcm ²	0.293kgcm ²	0.444 kgcm ²	1.466 kgcm ²

General data and operating conditions

Design	Smooth, round
Type	Flange B14 as per DIN 42948 and IEC 72; Form C
Cooling	Naturally ventilated
Insulation class	F
Winding insulation	max. voltage amplitude 1500 V; du/dt < 5 kV/μs
Permissible temperature range	
Operation	-20 °C ... + 40 °C
Enclosure	IP54 as per DIN EN60034-5
Connection	System connector
Temperature monitoring	KTY 110
Speed feedback	Pancake resolver (size 15) Absolute value encoder

Technical data on the spring-applied brake

Spring-applied brake	Assigned motor frame size	Brake voltage	Characteristic torque	Coil power at 20°C
BFK 457-02	SDSGSBS035	24 V	0.5 Nm	6.6 W
BFK 457-03	SDSGSBS047	24 V	1.0 Nm	9 W
BFK 457-04	SDSGSBS056	24 V	2.0 Nm	11.5 W

Technical data on the permanent magnetic brake

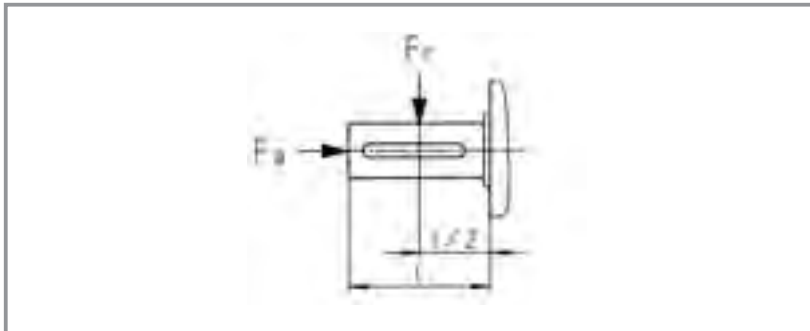
Permanent magnetic brake	Assigned motor frame size	Brake voltage	Characteristic torque	Coil power at 20°C
02.P1.130	SDSGSBS035	24 V	1.0 Nm	10W
03.P1.130	SDSGSBS047	24 V	2.0 Nm	11W
05.P1.130	SDSGSBS056	24 V	4.5 Nm	12W



Mechanical data

		Motor type		
		SDSGS 035-22	SDSGS 047-22	SDSGS 056-22
Max. radial force F_r at start of journal *)	[N]	250	300	510
Max. radial force F_r at centre of journal *)	[N]	260	350	550
Max. axial force F_a *)	[N]	200	250	420

*) Forces calculated for bearing life of 20,000 hours



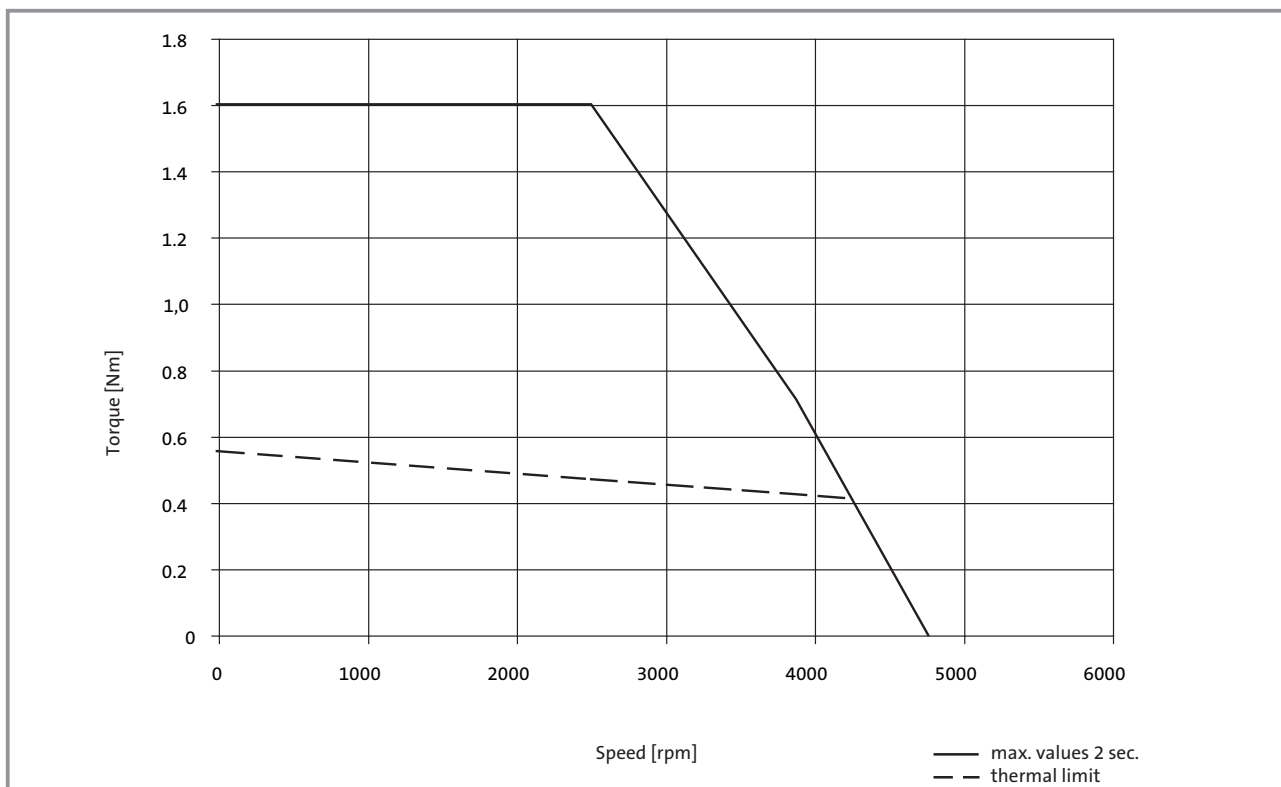
Application points of radial force (F_r) and axial force (F_a)



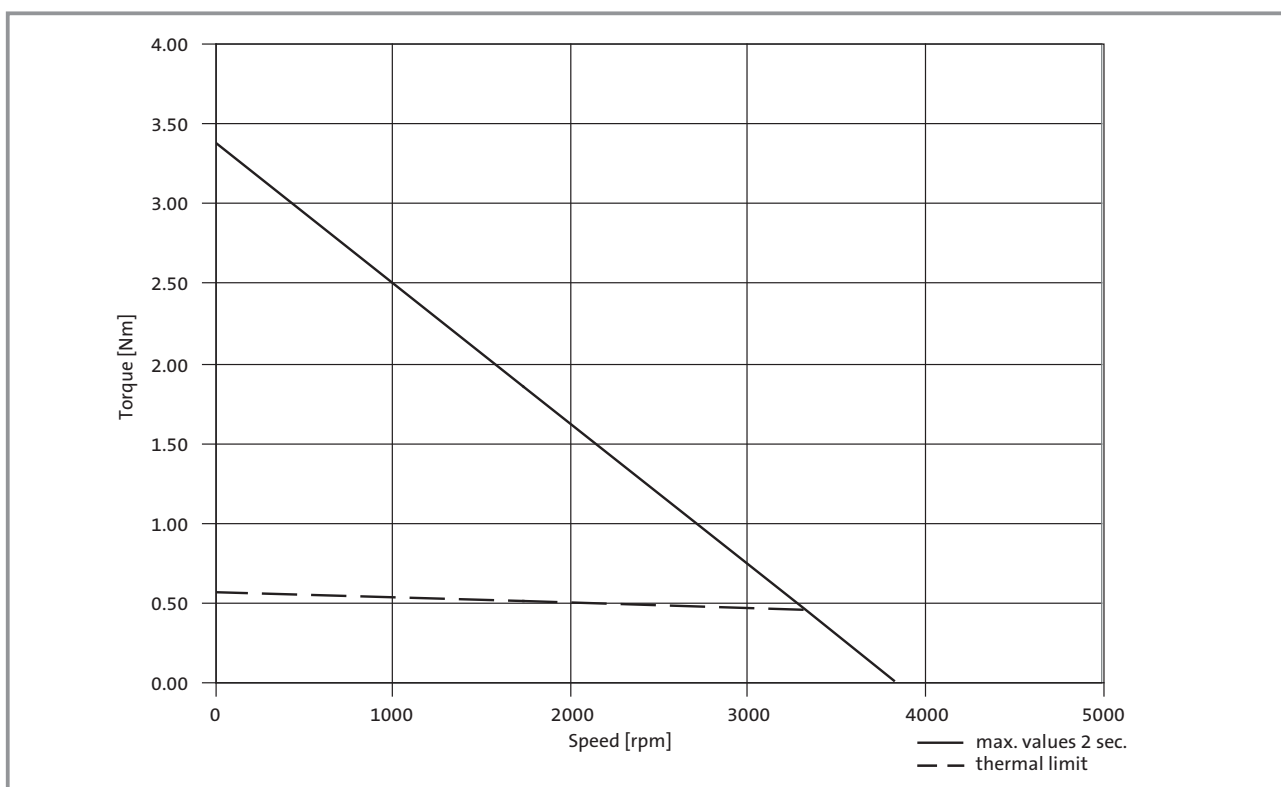
General information

Motor technology

Characteristics of SDSGSR5035-22 with 931E
24 V 0.45 Nm 3000 rpm 140 W

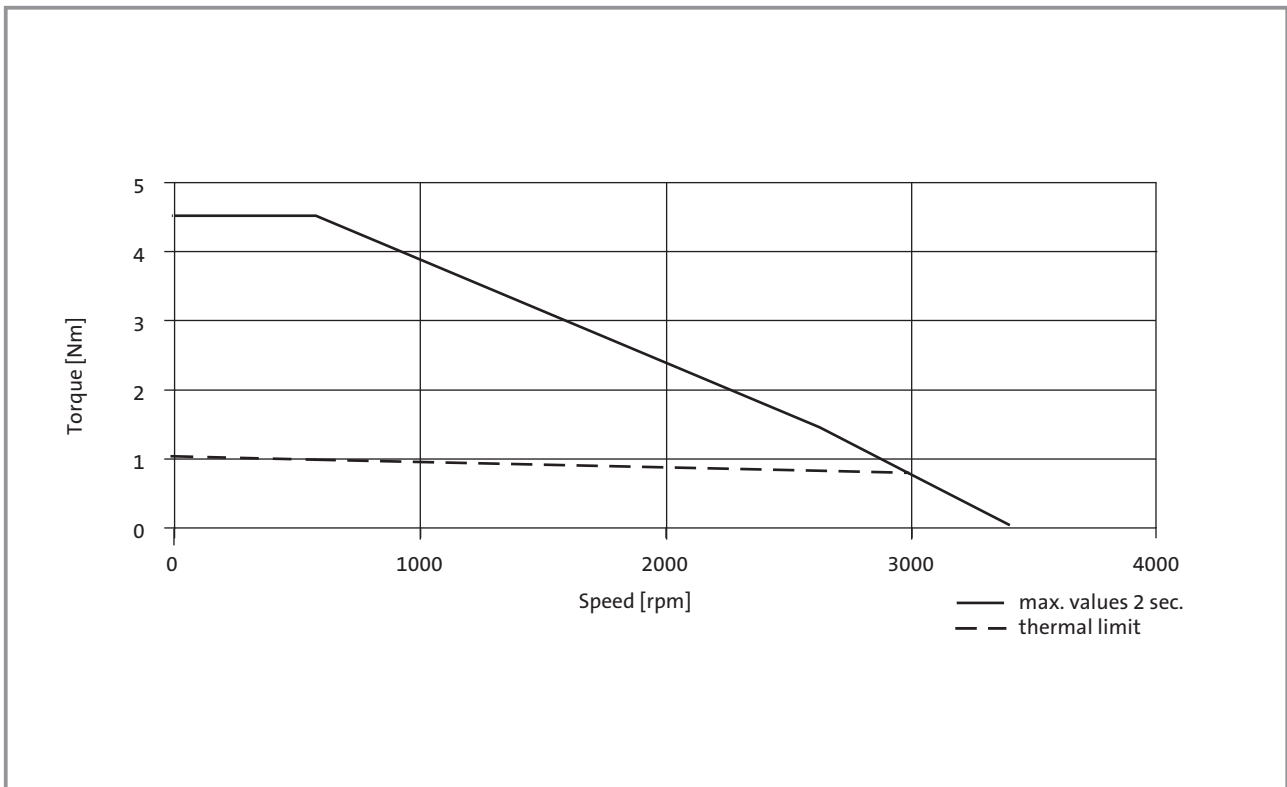


Characteristics of SDSGSR5035-22 with 931E
48 V 0.45 Nm 3000 rpm 140 W

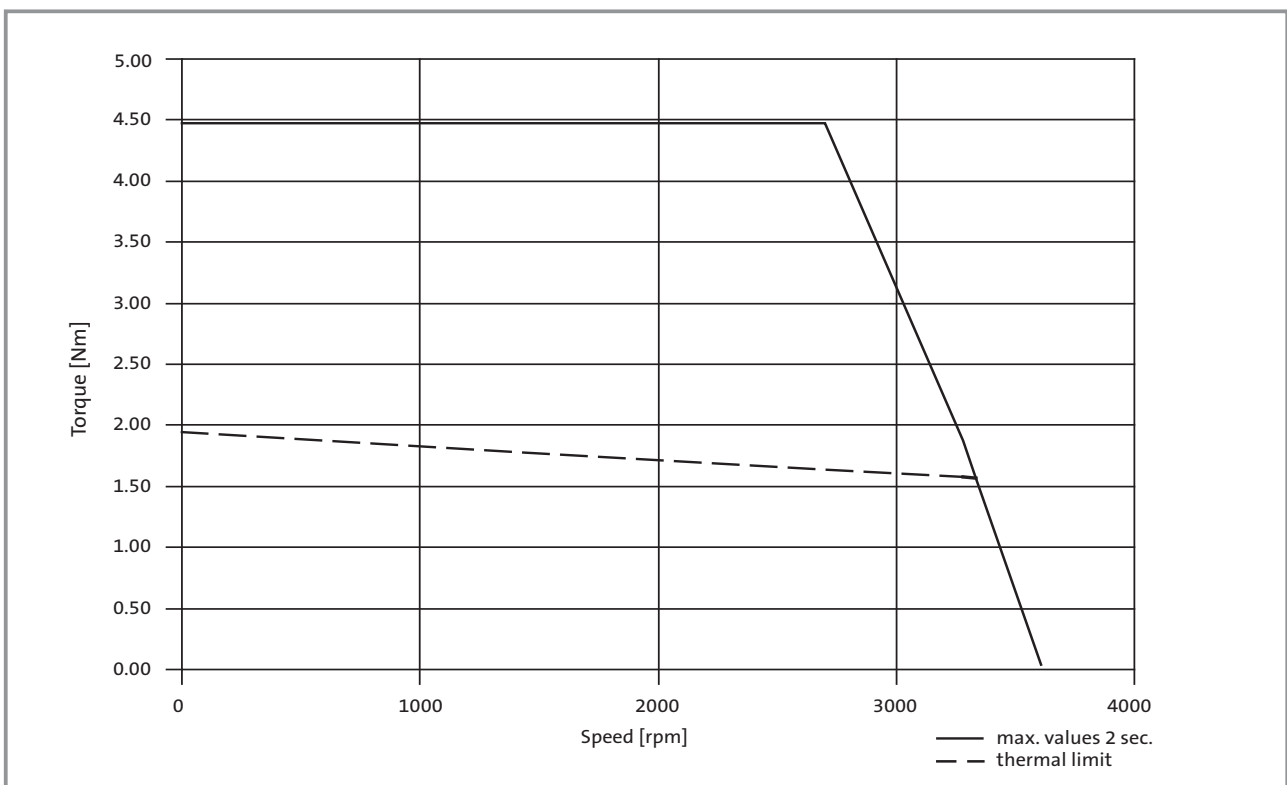




Characteristics of SDSGSR5047-22 with 931E
48 V 0.8 Nm 2500 rpm 210 W



Characteristics of SDSGSR5056-22 with 931E
48 V 1.6 Nm 2700 rpm 450 W





Drive selection

Servo Drives 930

Selection table type 931E□K10

P _N W	Description	Design	Controller type	Selection Please mark as appropriate
620	24-48V DC, 13A, max. 35A Digital frequency coupling, digital and analog inputs/outputs Resolver and absolute value encoder feedback Brake control PC interface RS232	CAN bus	931ECK10	
620	24-48V DC, 13A, max. 35A Digital frequency coupling, digital and analog inputs/outputs Resolver and absolute value encoder feedback Brake control PC interface RS232	PROFIBUS	931EPK10	

Servo Drives accessories

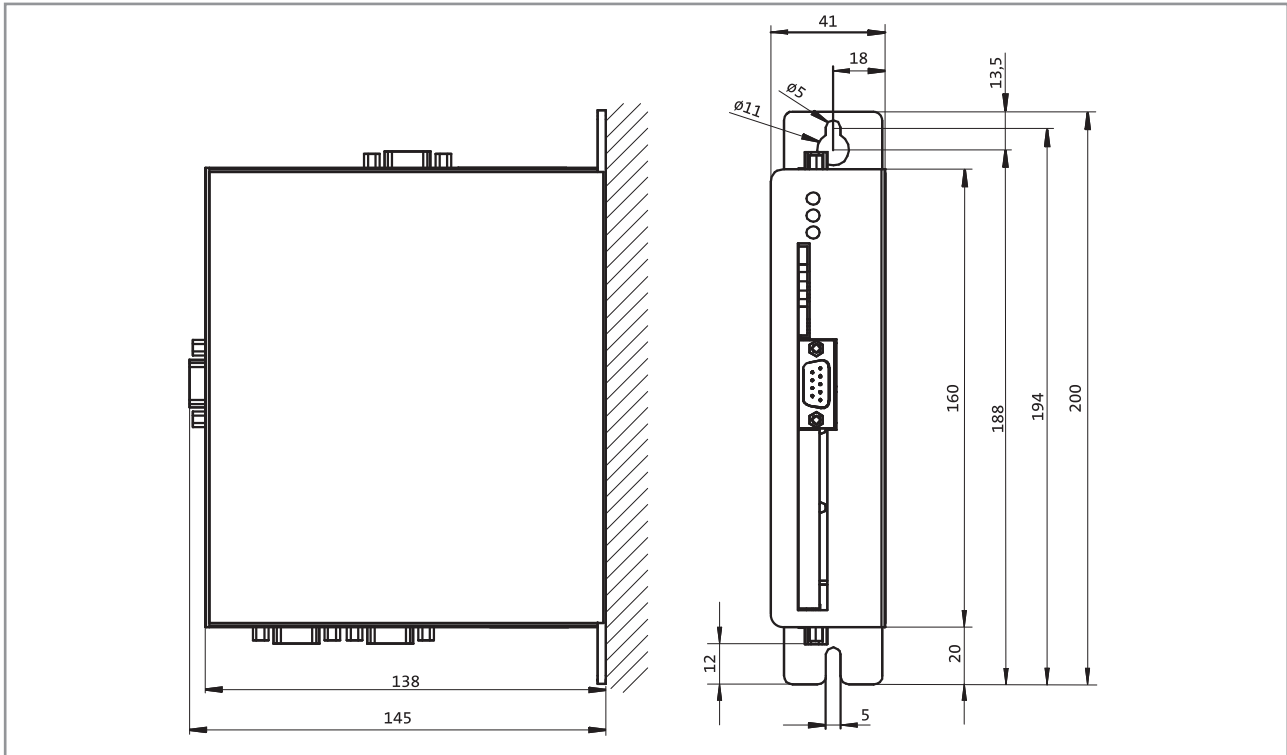
Servo Drives accessories		Selection Please mark as appropriate
System cable	931EKL03UBO (motor connection 2.5 m)	
	931EKL05UBO (motor connection 5 m)	
	931EKR03UBS (resolver connection 2.5 m)	
	931EKR05UBS (resolver connection 5 m)	
	931EKE03UBS (absolute value encoder connection 2.5 m)	
	931EKE05UBS (absolute value encoder connection 5 m)	
	931EKE03USS (digital frequency connection 3 m)	
	931EKC03USS (CAN plug/plug 3 m)	
	931EKS02UBB (PC connection RS232)	
Memory card	MMC-64 MB	
CAN resistor	931EKC01UX (resistor)	
Power supply unit	24 V/5 A, 230 V/50 Hz (control voltage)	
	24 V/10 A, 230 V/50 Hz	
	24 V/20 A, 230 V/50 Hz	
	48 V/5 A, 230 V/50 Hz	
	48 V/10 A, 400 V/50 Hz	
	48 V/20 A, 400 V/50 Hz	

See page 6 for type code.

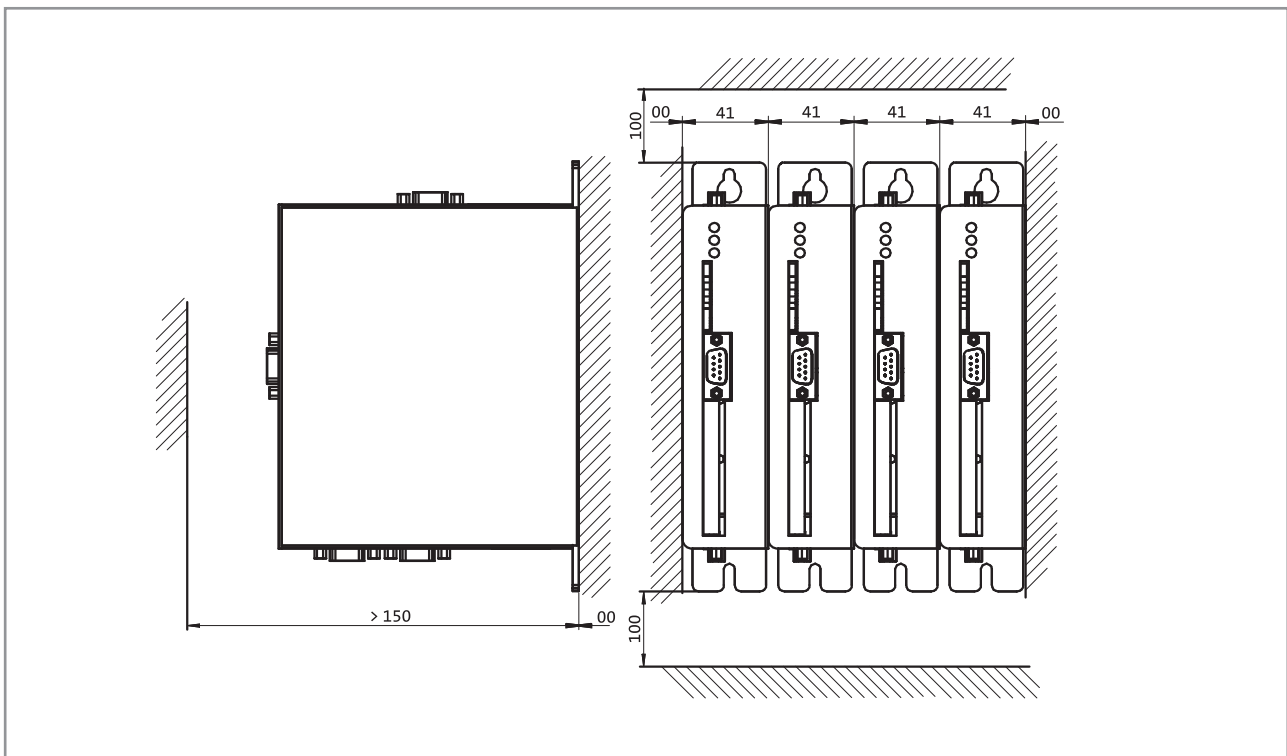
See page 10 for mounting position.



Dimensions



Clearance





Drive selection

SDSGS servo motors

Selection table for type SDSGS□□□□□-22

Supply voltage V DC V	P _N W	Rated data		Design A-side	Motor type	Selection Please mark as appropriate
		n ₂ rpm	M ₂ Nm			
24	140	3000	0.45	IEC56 B14 C80	SDSGS□□035-22	
48	140	3000	0.45	IEC56 B14 C80	SDSGS□□035-22	
48	210	2500	0.80	IEC56 B14 C80	SDSGS□□047-22	
48	210	2500	0.80	IEC63 B14 C90	SDSGS□□047-22	
48	450	2700	1.60	IEC63 B14 C90	SDSGS□□056-22	

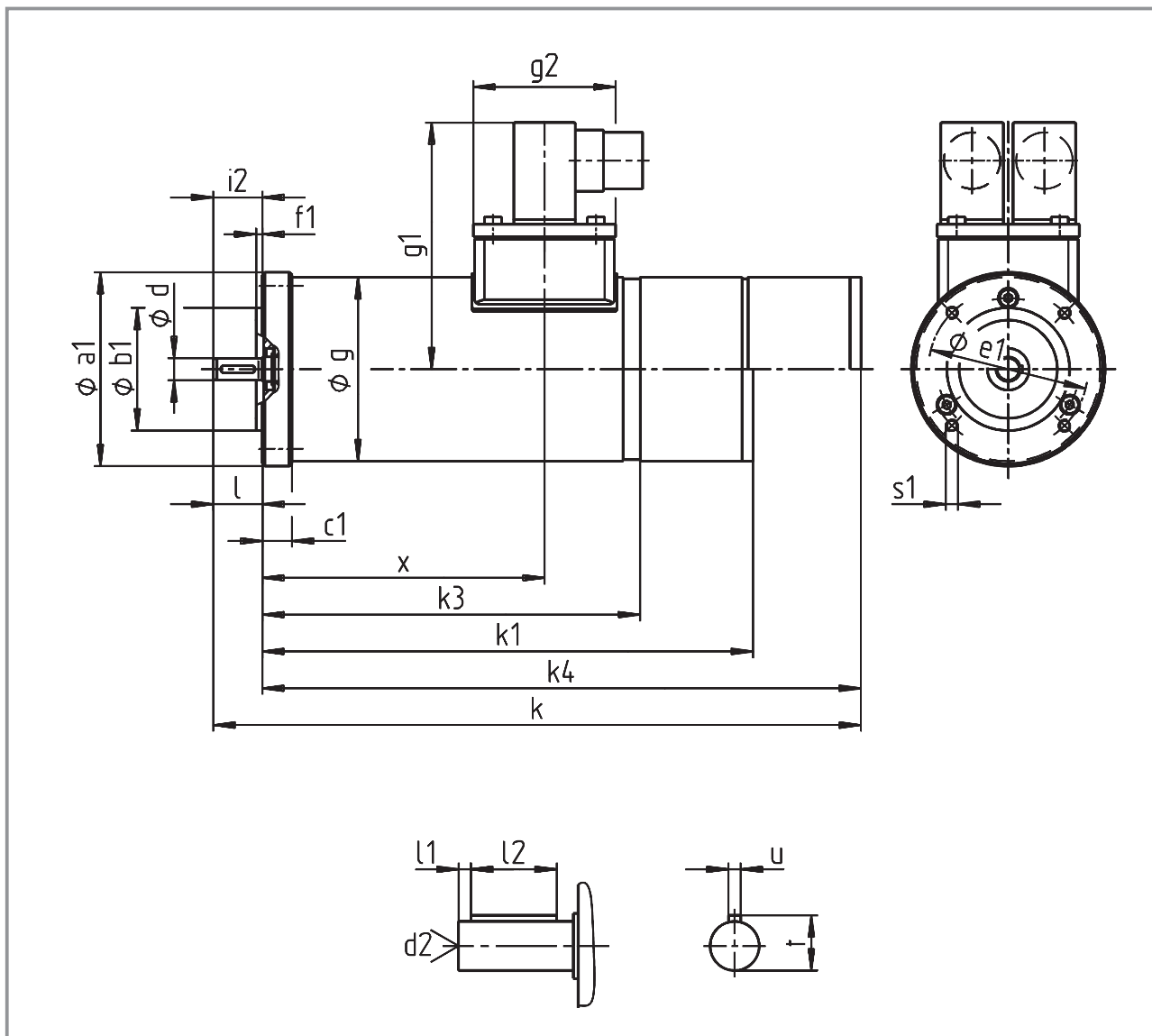
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder (not possible with motor frame size 035)	
	with spring-applied brake and multi-turn absolute value encoder (not possible with motor frame size 035)	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Position of electrical connection		2

See page 8 for type code.
See page 10 for mounting position.



Dimensions of type SDSGS□□□□□-22



Motor type	Size	a_1	b_1 j_7	c_1	d k_6	d_2	e_1	f_1	g	g_1	g_2	i_2	k BS^*	RS^*	k_1 AG^*
SDSGS□□035-22	IEC56C80	79	50	12	9	M3	65	2.5	65	95	58	20	224	169	180
SDSGS□□047-22	IEC56C80	79	50	12	9	M3	65	2.5	75	101	58	20	253	189	200
SDSGS□□047-22	IEC63C90	89	60	12	11	M4	75	2.5	75	101	58	23	256	189	200
SDSGS□□056-22	IEC63C90	89	60	12	11	M4	75	2.5	85	106	58	23	271	196	207

Motor type	Size	k_3	BS^*	k_4 BA^*	l	l_1	l_2	s_1	r	u	x	Weight approx. kg
SDSGS□□035-22	IEC56C80	138	204	225	20	3	14	M5	10.2	3	95	1.9-2.9
SDSGS□□047-22	IEC56C80	156	233	244	20	3	14	M5	10.2	3	115	3.0-4.0
SDSGS□□047-22	IEC63C90	156	233	244	23	3	18	M5	12.5	4	115	3.0-4.0
SDSGS□□056-22	IEC63C90	163	248	260	23	3	18	M5	12.5	4	120	4.0-5.5

Dimensions in mm

* see Page 8



Drive selection

Servo worm geared motors SSN

Selection table for type SSN31-1G□□□-035C22

Motor type	P _N W	Supply voltage for Servo Drive = 24 or 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-035-22	140	600	1.91	7.32	5	
		429	2.61	5.35	7	
		300	3.47	4.04	10	
		200	5.00	3.20	15	
		150	6.21	2.42	20	
		120	6.86	2.04	25	
		100	7.97	1.88	30	
		79	9.75	1.64	38	
		60	10.35	1.26	50	
		55	12.87	1.17	55	
		40	11.00	0.91	75	
		30	11.00	0.64	100	

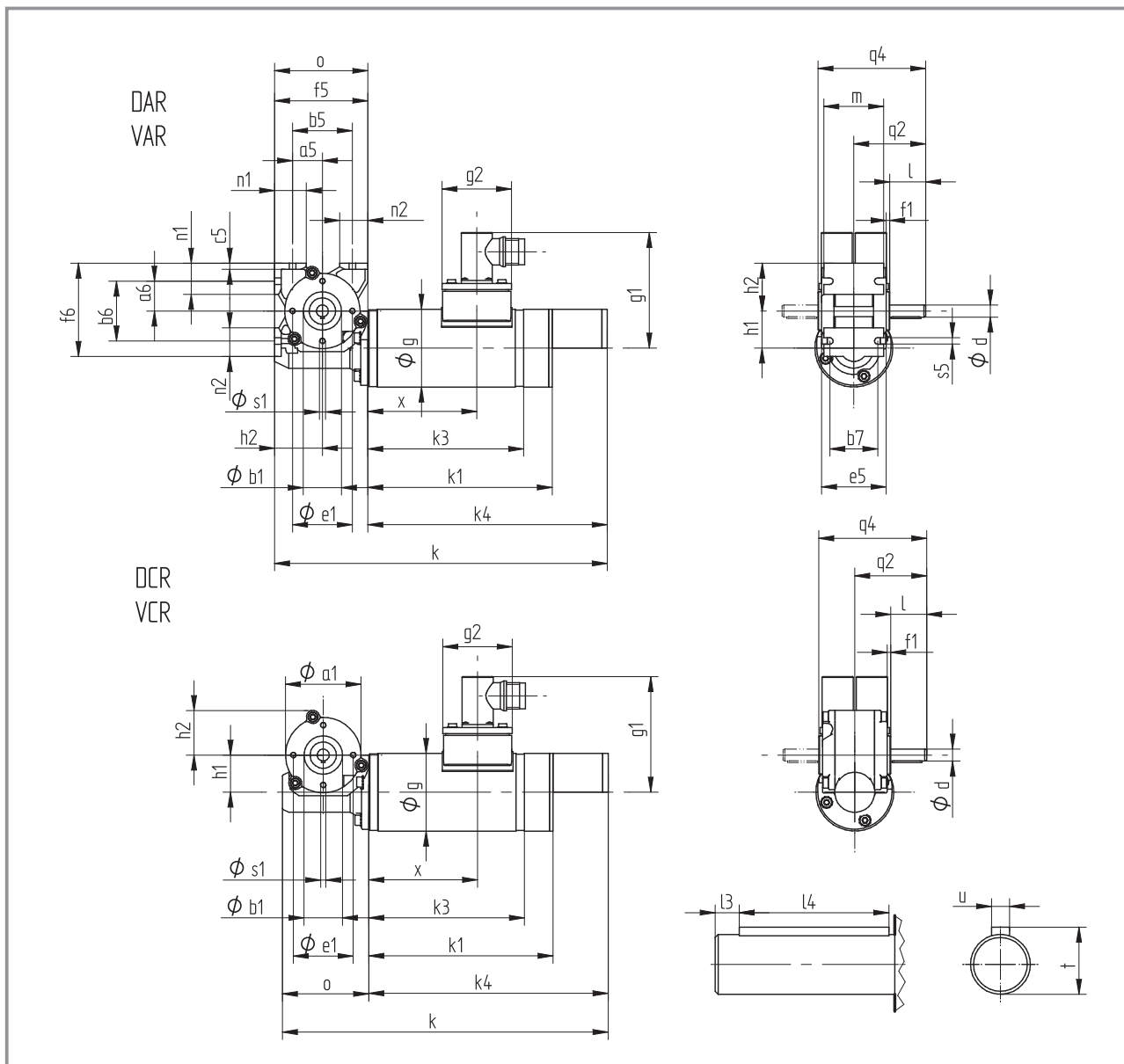
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VAR	
	DAR	
	VAL	
	HAR	
	VCR	
	DCR	
	VCL	
	HCR	
Output flange diameter	100 mm	
	118.5 mm	
	120 mm	
Shaft diameter	10 mm	
	12 mm	
Shaft position on version VAR/VCR		3 5
Flange/shaft position on version VAL/VCL		3 5
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type SSN31-1G□□□-035C22



Geared motor	a ₁	a ₅	a ₆	b ₁ h ₈	b ₅	b ₆	b ₇	c ₅	d h ₆	e ₁	e ₅	f ₁	f ₅	f ₆	g	g ₁	g ₂	h ₁	h ₂	k BS*
SSN31-1GVAR-035C22	63	25	25	32	50	50	40	5	10	50	54	2.5	78	78	65	95	58	31	40	278
SSN31-1GVAR-035C22	63	25	25	32	50	50	40	5	12	50	54	2.5	78	78	65	95	58	31	40	278
SSN31-1GVCR-035C22	63	—	—	32	—	—	—	—	10	50	54	2.5	—	—	65	95	58	31	37.5	272
SSN31-1GVCR-035C22	63	—	—	32	—	—	—	—	12	50	54	2.5	—	—	65	95	58	31	37.5	272

Geared motor	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₃	l ₄	m	n ₁	n ₂	o	q ₂	q ₄	s ₁	s ₅	t	u	x	Weight
SSN31-1GVAR-035C22	164.5	176	134	200	220.5	30	4	25	50	26	24	78	60	90	M5	5.5	11.2	3	91	2.6-3.7
SSN31-1GVAR-035C22	164.5	176	134	200	220.5	40	4	28	50	26	24	78	70	100	M5	5.5	13.5	4	91	2.6-3.7
SSN31-1GVCR-035C22	164.5	176	134	200	220.5	30	4	25	—	—	—	72	60	90	M5	—	11.2	3	91	2.6-3.7
SSN31-1GVCR-035C22	164.5	176	134	200	220.5	40	4	28	—	—	—	72	70	100	M5	—	13.5	4	91	2.6-3.7

Dimensions in mm

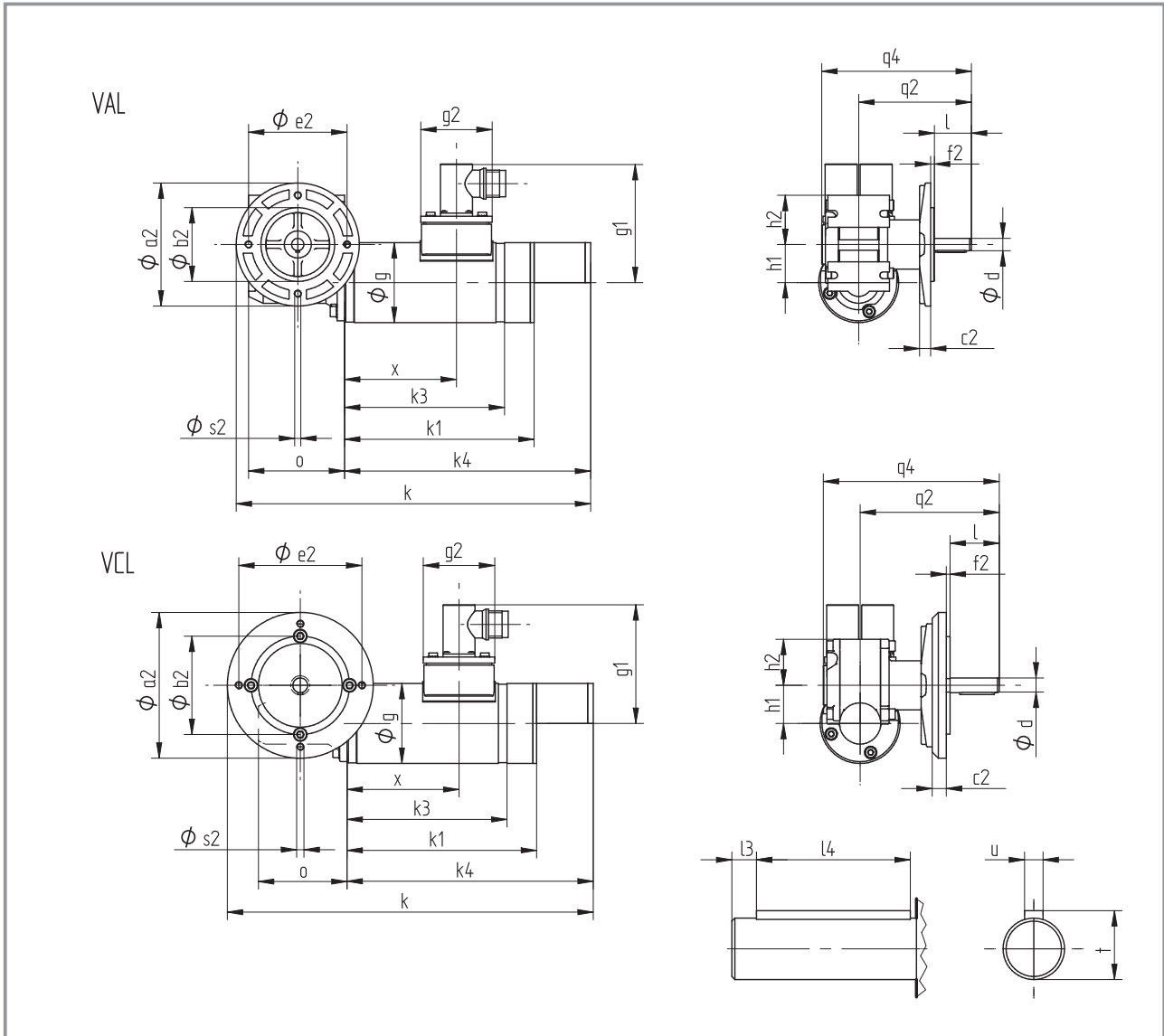
* see Page 8



Drive selection

Servo worm geared motors SSN

Dimensions for type SSN31-1G□□□-035C22



Geared motor	a_2	b_2 j7	c_2	d h6	e_2	f_2	g	g_1	g_2	h_1	h_2	k BS*	k_1 RS*
SSN31-1GVAL-035C22	100	60	9	10	80	3	65	95	58	31	40	288	164.5
SSN31-1GVAL-035C22	120	80	9	12	100	3	65	95	58	31	40	298	164.5
SSN31-1GVCL-035C22	100	60	9	10	80	3	65	95	58	31	37.5	288	164.5
SSN31-1GVCL-035C22	118.5	80	11.5	12	100	3	65	95	58	31	37.5	298	164.5

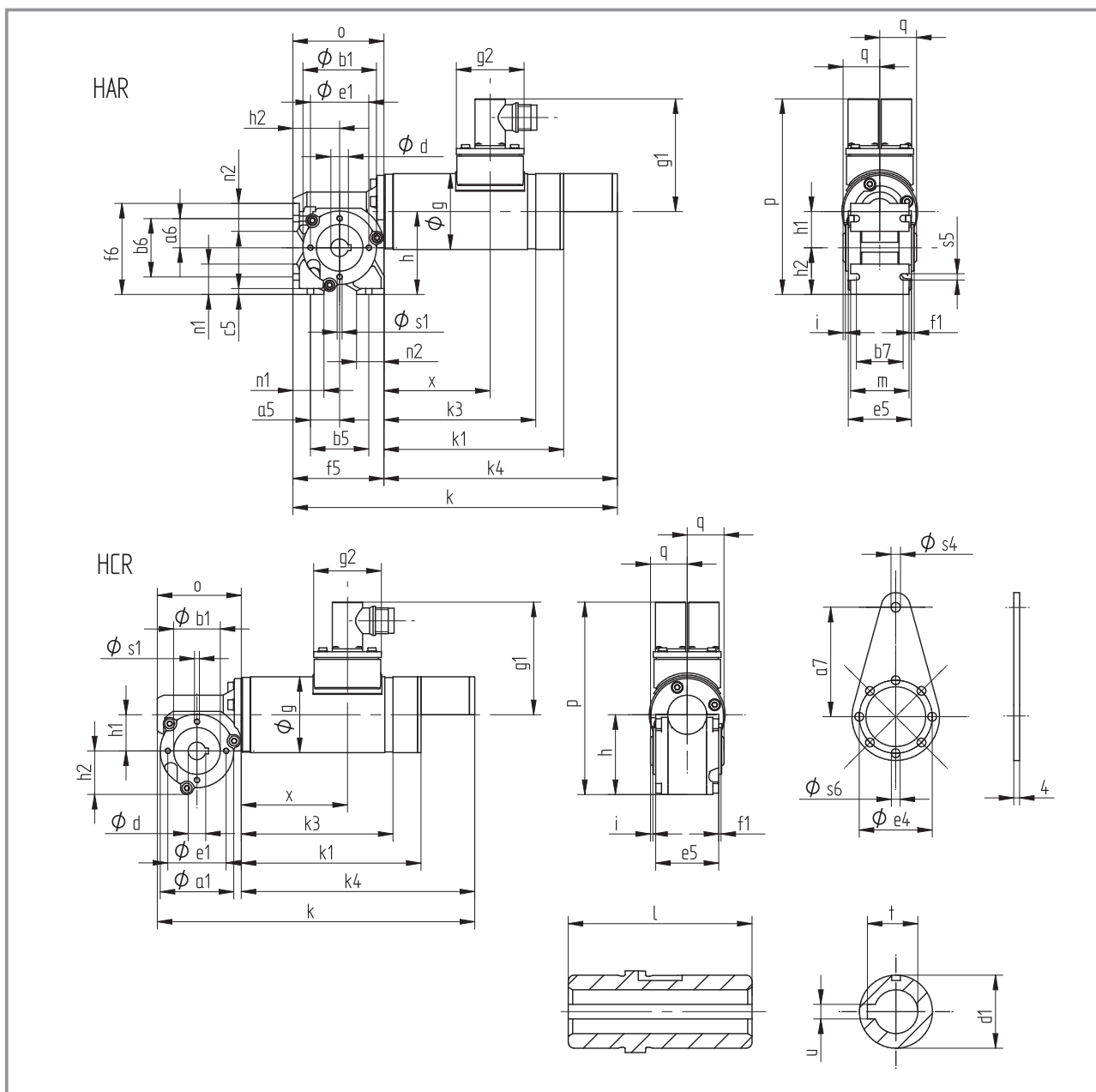
Geared motor	k_1 AG*	k_3	k_4 BS*	k_4 BA*	l	l_3	l_4	o	q_2	q_4	s_2	t	u	x	Weight
SSN31-1GVAL-035C22	176	134	200	220.5	30	4	25	78	91.5	121.5	M6	11.2	3	91	2.6-3.7
SSN31-1GVAL-035C22	176	134	200	220.5	40	4	28	78	101.5	131.5	M6	13.5	4	91	2.6-3.7
SSN31-1GVCL-035C22	176	134	200	220.5	30	4	25	72	91.5	121.5	M6	11.2	3	91	2.6-3.7
SSN31-1GVCL-035C22	176	134	200	220.5	40	4	28	72	113	143	M6	13.5	4	91	2.6-3.7

Dimensions in mm

* see Page 8



Dimensions for type SSN31-1G□□□-035C22



Geared motor	a ₁	a ₅	a ₆	a ₇	b ₁ h8	b ₅	b ₆	b ₇	c ₅	d h7	d ₁	e ₁	e ₄	e ₅	f ₁	f ₅	f ₆	g	g ₁	g ₂	h	h ₁	h ₂
SSN31-1GHAR-035C22	63	25	25	75	40	50	50	40	5	15	25	50	50	54	2.5	78	78	65	95	58	71	31	40
SSN31-1GHCRC-035C22	63	—	—	75	40	—	—	—	—	15	25	50	50	54	2.5	—	—	65	95	58	68.5	31	37.5

Geared motor	i	k BS*	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	m	n ₁	n ₂	o	p	q	s ₁	s ₄	s ₅	s ₆	t	u	x	Weight
SSN31-1GHAR-035C22	2	278	164.5	176	134	200	220.5	63	50	26	24	78	166	27	M5	6.5	5.5	6	17.3	5	91	2.6-3.7
SSN31-1GHCRC-035C22	2	272	164.5	176	134	200	220.5	63	—	—	—	72	163.5	27	M5	6.5	—	6	17.3	5	91	2.6-3.7

Dimensions in mm

* see Page 8



Drive selection

Servo worm geared motors SSN

Selection table for type SSN40-1G□□□-047C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-047-22	210	368	4.57	7.66	6.75	
		250	6.48	5.40	10	
		167	8.88	3.72	15	
		125	11.36	2.99	20	
		100	12.80	2.27	25	
		83	14.88	2.42	30	
		63	17.92	1.90	40	
		50	21.60	1.48	50	
		42	18.24	1.75	60	
		31	23.96	0.96	80	

Additional ordering details

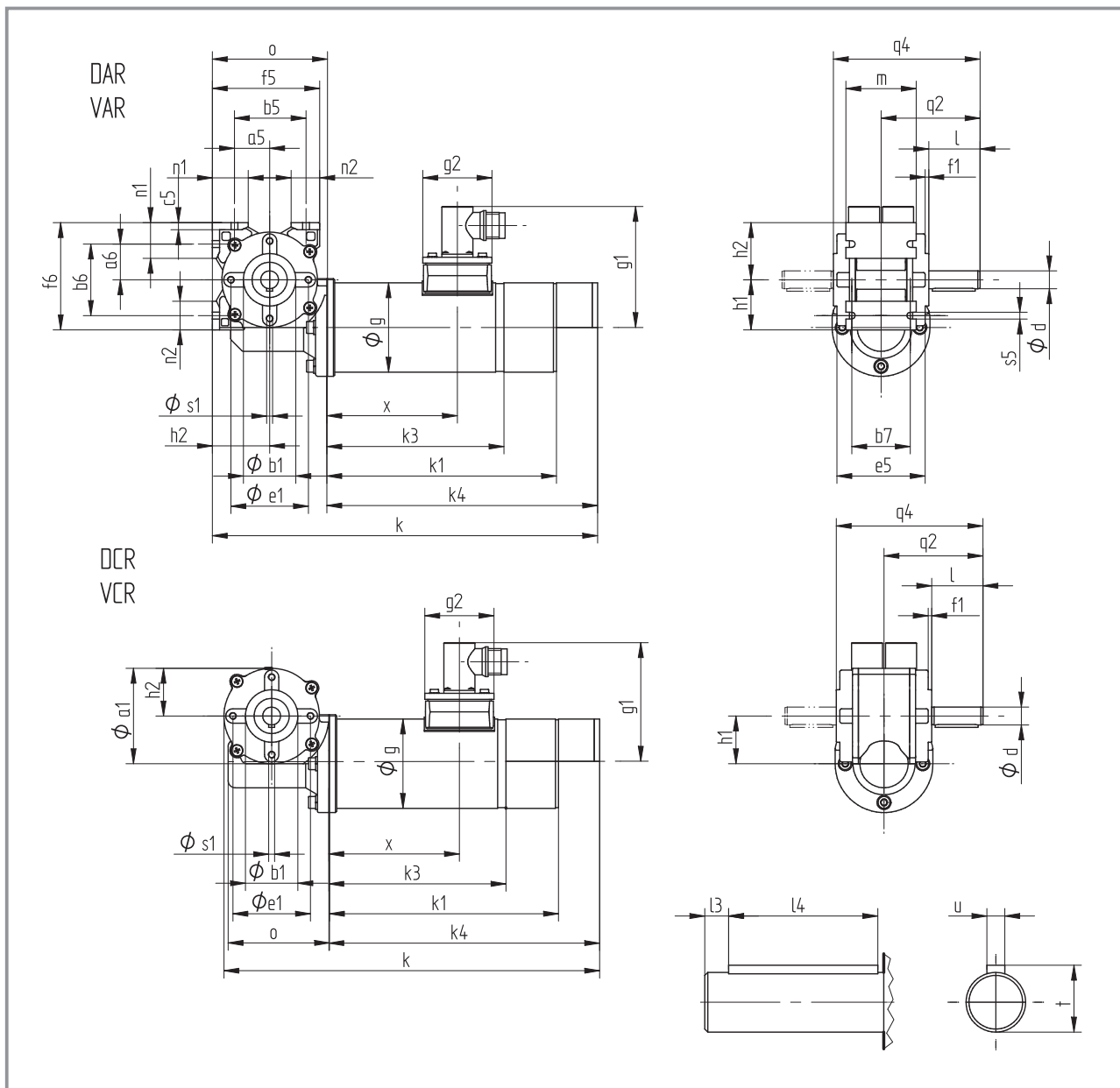
Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VAR	
	DAR	
	VAL	
	HAR	
	VCR	
	DCR	
	VCL	
	HCR	
Shaft position on version VAR/VCR		3 5
Flange/shaft position on version VAL/VCL		3 5
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.

See page 10 for mounting position.



Dimensions for type SSN40-1G□□□-047C22



Geared motor	a ₁	a ₅	a ₆	b ₁ h10	b ₅	b ₆	b ₇	c ₅	d h6	e ₁	e ₅	f ₁	f ₅	f ₆	g	g ₁	g ₂	h ₁	h ₂	k BS*
SSN40-1GVAR-047C22	77	30	30	44	60	60	50	6	15	65	80	2	90	90	75	101	58	40	48	323
SSN40-1GVCR-047C22	77	—	—	44	—	—	—	—	15	65	80	2	—	—	75	101	58	40	40	315

Geared motor	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₃	l ₄	m	n ₁	n ₂	o	q ₂	q ₄	s ₁	s ₅	t	u	x	Weight
SSN40-1GVAR-047C22	183	194.5	150.5	227	238.5	43	4	36	59	30	24	96	83	123	M6	5.5	17	5	109.5	4.5-5.8
SSN40-1GVCR-047C22	183	194.5	150.5	227	238.5	43	4	36	—	—	—	88	83	123	M6	—	17	5	109.5	4.5-5.8

Dimensions in mm

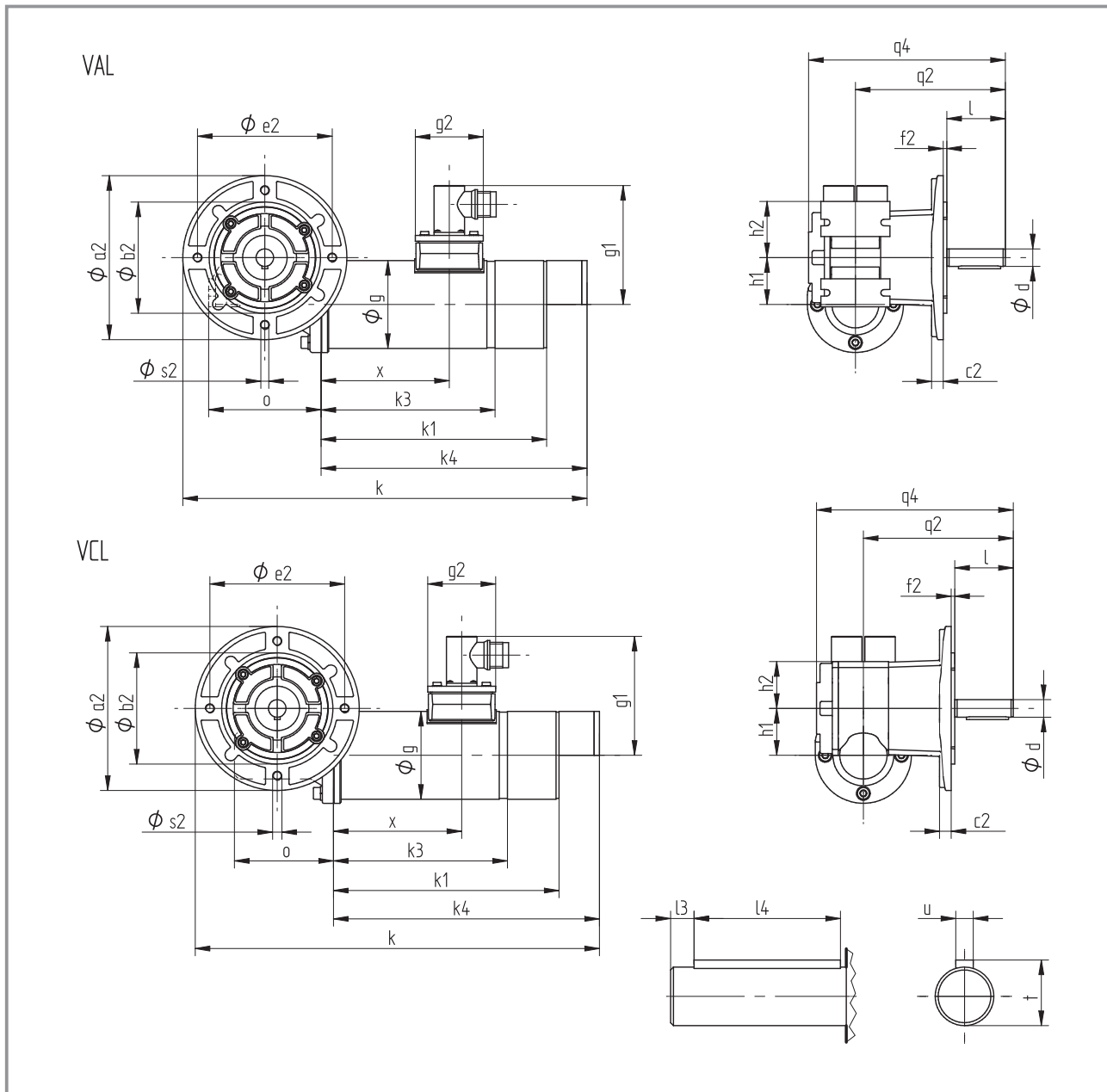
* see Page 8



Drive selection

Servo worm geared motors SSN

Dimensions for type SSN40-1G□□□-047C22



Geared motor	a ₂	b ₂ j7	c ₂	d h6	e ₂	f ₂	g	g ₁	g ₂	h ₁	h ₂	k BS*	k ₁ RS*
SSN40-1GVAL-047C22	140	95	10	15	115	3	75	101	58	40	48	345	183
SSN40-1GVCL-047C22	140	95	10	15	115	3	75	101	58	40	40	345	183

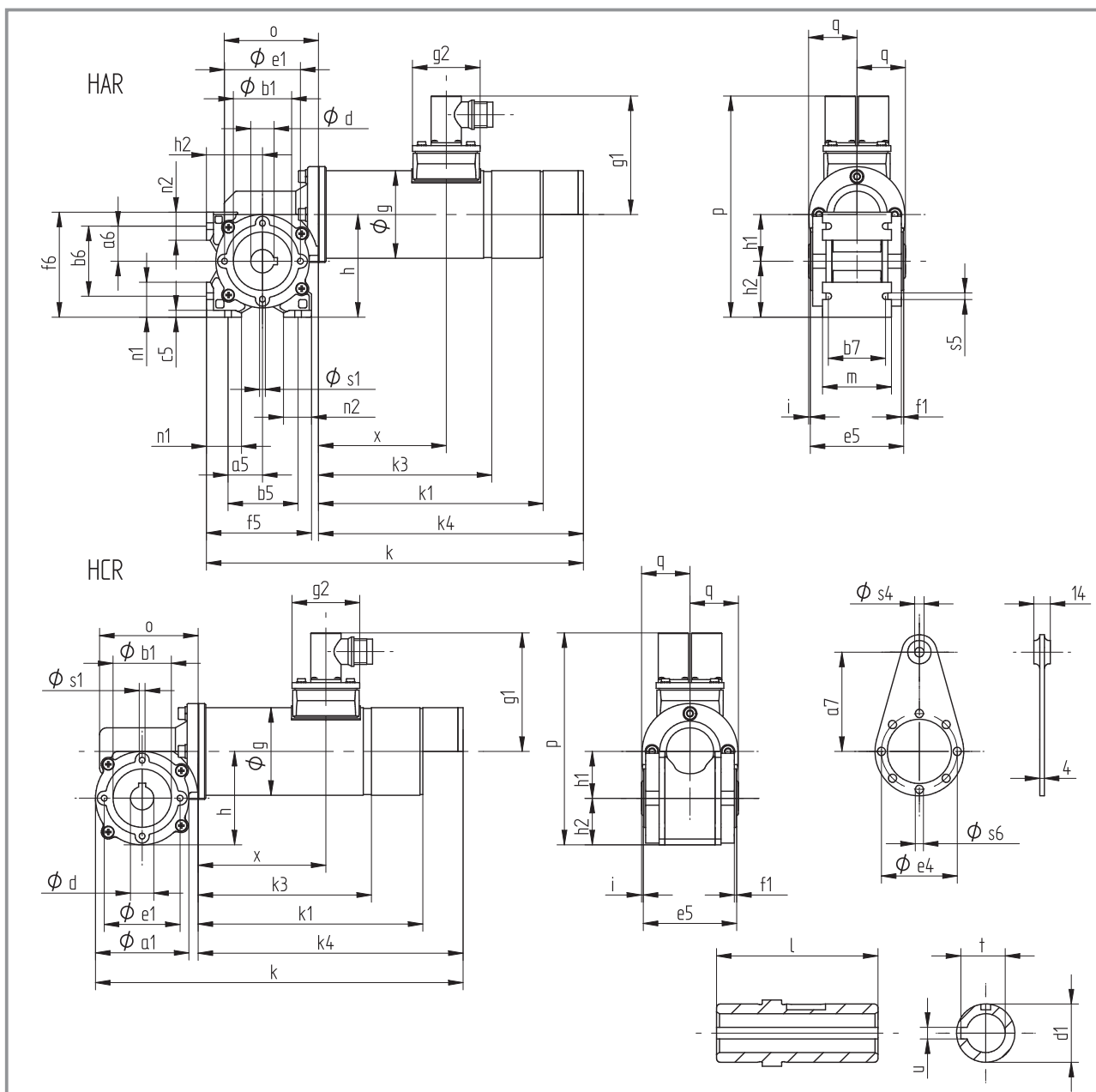
Geared motor	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₃	l ₄	o	q ₂	q ₄	s ₂	t	u	x	Weight
SSN40-1GVAL-047C22	194.5	150.5	227	238.5	50	4	36	96	128	168	M8	17	5	109.5	4.5-5.8
SSN40-1GVCL-047C22	194.5	150.5	227	238.5	50	4	36	88	128	168	M8	17	5	109.5	4.5-5.8

Dimensions in mm

* see Page 8



Dimensions for type SSN40-1G□□□-047C22



Geared motor	a ₁	a ₅	a ₆	a ₇	b ₁ h8	b ₅	b ₆	b ₇	c ₅	d H7	d ₁	e ₁	e ₄	e ₅	f ₁	f ₅	f ₆	g	g ₁	g ₂	h	h ₁	h ₂
SSN40-1GHAR-047C22	77	30	30	85	50	60	60	50	6	20	30	65	65	80	2	90	90	75	101	58	88	40	48
SSN40-1GHCRC-047C22	77	—	—	85	50	—	—	—	—	20	30	65	65	80	2	—	—	75	101	58	80	40	40

Geared motor	i	k BS*	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	m	n ₁	n ₂	o	p	q	s ₁	s ₄	s ₅	s ₆	t	u	x	Weight
SSN40-1GHAR-047C22	1.5	323	183	194.5	150.5	227	238.5	83	59	30	24	96	189	41.5	M6	8	5.5	7	22.8	6	109.5	4.5-5.8
SSN40-1GHCRC-047C22	1.5	315	183	194.5	150.5	227	238.5	83	—	—	—	88	181	41.5	M6	8	—	7	22.8	6	109.5	4.5-5.8

Dimensions in mm

* see Page 8



Drive selection

Planetary geared servo motors SPL

Selection table for type SPL52-□GVCR-035N22

Motor type	P _N W	Supply voltage for Servo Drive = 24 or 48 V DC			i 1-stage	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-035-22	140	811	1.33	3.00	3.70	
		444	2.43	1.65	6.75	
					i 2-stage	
		218	4.63	2.59	13.73	
		120	8.44	1.42	25.01	
		66	15.38	0.78	45.56	
					i 3-stage	
		59	16.03	1.56	50.89	
		32	25.00	0.86	92.70	

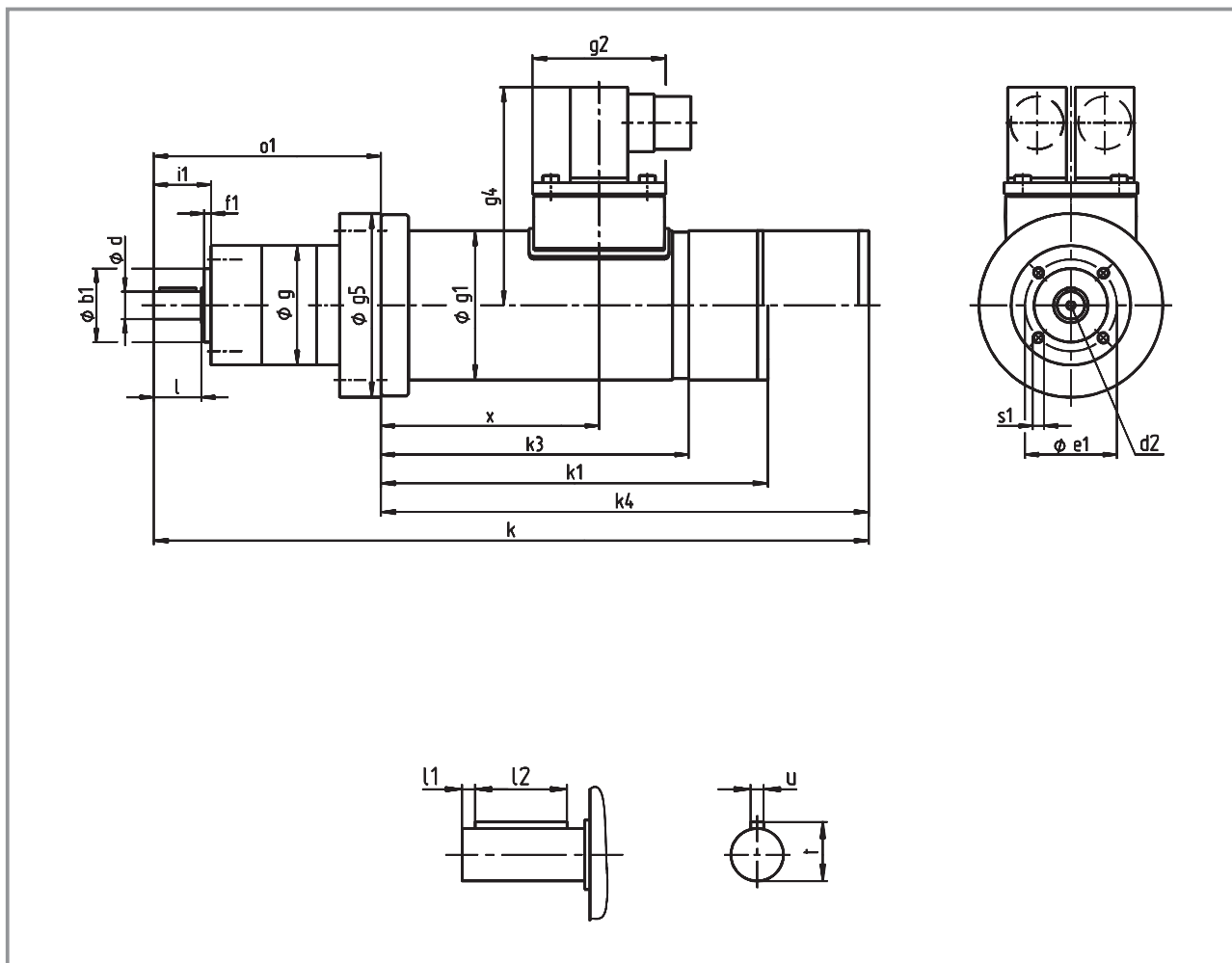
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Position of electrical connection		2

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type SPL52-□GVCR-035N22



Geared motor	Ratio i	b ₁ h8	d h7	d ₂	e ₁	f ₁	g	g ₁	g ₂	g ₄	g ₅	i ₁	k BS*
SPL52-□GVCR-035N22	3.7;6.7	32	12	M4	40	3	52	65	58	95	80	25	303
	14 ... 46												317
	51 ... 93												331

Geared motor	Ratio i	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	o ₁	s ₁	t	u	x	Weight
SPL52-□GVCR-035N22	3.7;6.7	169	180	138	204	225	20.8	2.5	16	99	M5x10	13.5	4	95	2.6-3.6
	14 ... 46									113					2.8-3.8
	51 ... 93									127					3.0-4.0

Dimensions in mm

* see Page 8



Drive selection

Planetary geared servo motors SPL

Selection table for type SPL62-□GVCR-035N22

Motor type	P _N W	Supply voltage for Servo Drive = 24 or 48 V DC			i 1-stage	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-035-22	140	811	1.33	6.01	3.70	
		444	2.43	3.29	6.75	
					i 2-stage	
		218	4.63	5.40	13.73	
		120	8.44	2.96	25.01	
		86	11.80	2.12	34.97	
		66	15.38	1.63	45.56	
					i 3-stage	
		59	16.03	3.12	50.89	
		42	22.42	2.23	71.16	
		30	31.34	1.60	99.50	
		24	39.05	1.28	123.97	

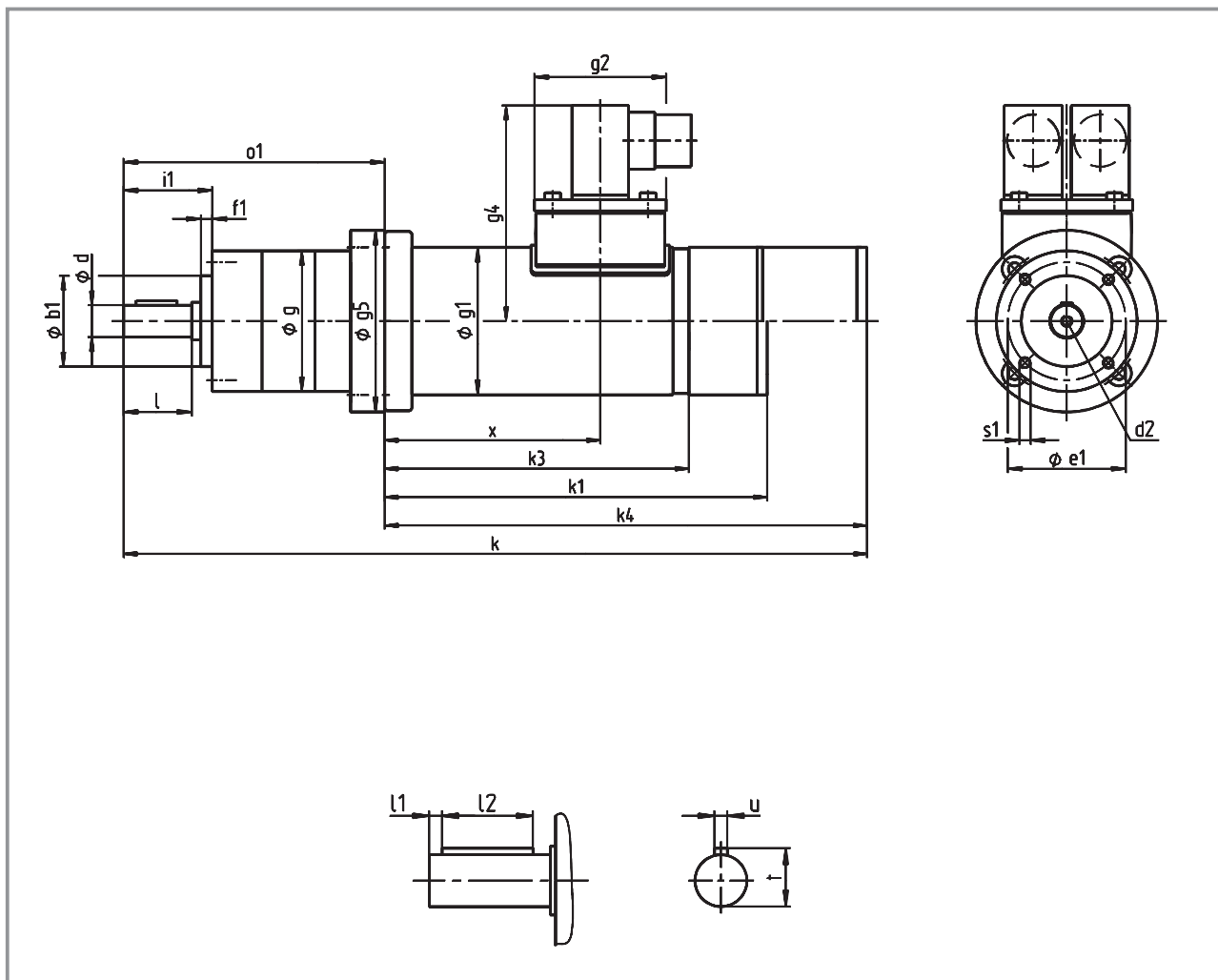
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Position of electrical connection		2

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type SPL62-□GVCR-035N22



Geared motor	Ratio i	b ₁ j7	d h7	d ₂	e ₁	f ₁	g	g ₁	g ₂	g ₄	g ₅	i ₁	k BS*
SPL62-□GVCR-035N22	3.7;6.7	40	14	M5	52	5	62	65	58	95	80	39	340
	14 ... 46												356
	51 ... 124												372

Geared motor	Ratio i	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	o ₁	s ₁	t	u	x	Weight
SPL62-□GVCR-035N22	3.7;6.7	169	180	138	204	225	30	5.5	18	115	M5x10	16	5	95	2.8-3.8
	14 ... 46									131					3.2-4.2
	51 ... 124									147					3.6-4.6

Dimensions in mm

* see Page 8



Drive selection

Planetary geared servo motors SPL

Selection table for type SPL62-□GVCR-047N22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i 1-stage	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-047-22	210	676	2.37	3.38	3.70	
		370	4.32	1.85	6.75	
					i 2-stage	
		182	8.24	3.03	13.73	
		100	15.01	1.67	25.01	
		72	20.98	1.19	34.97	
		55	25.00	0.91	45.56	
					i 3-stage	
		49	28.50	1.75	50.89	
		35	39.85	1.25	71.16	

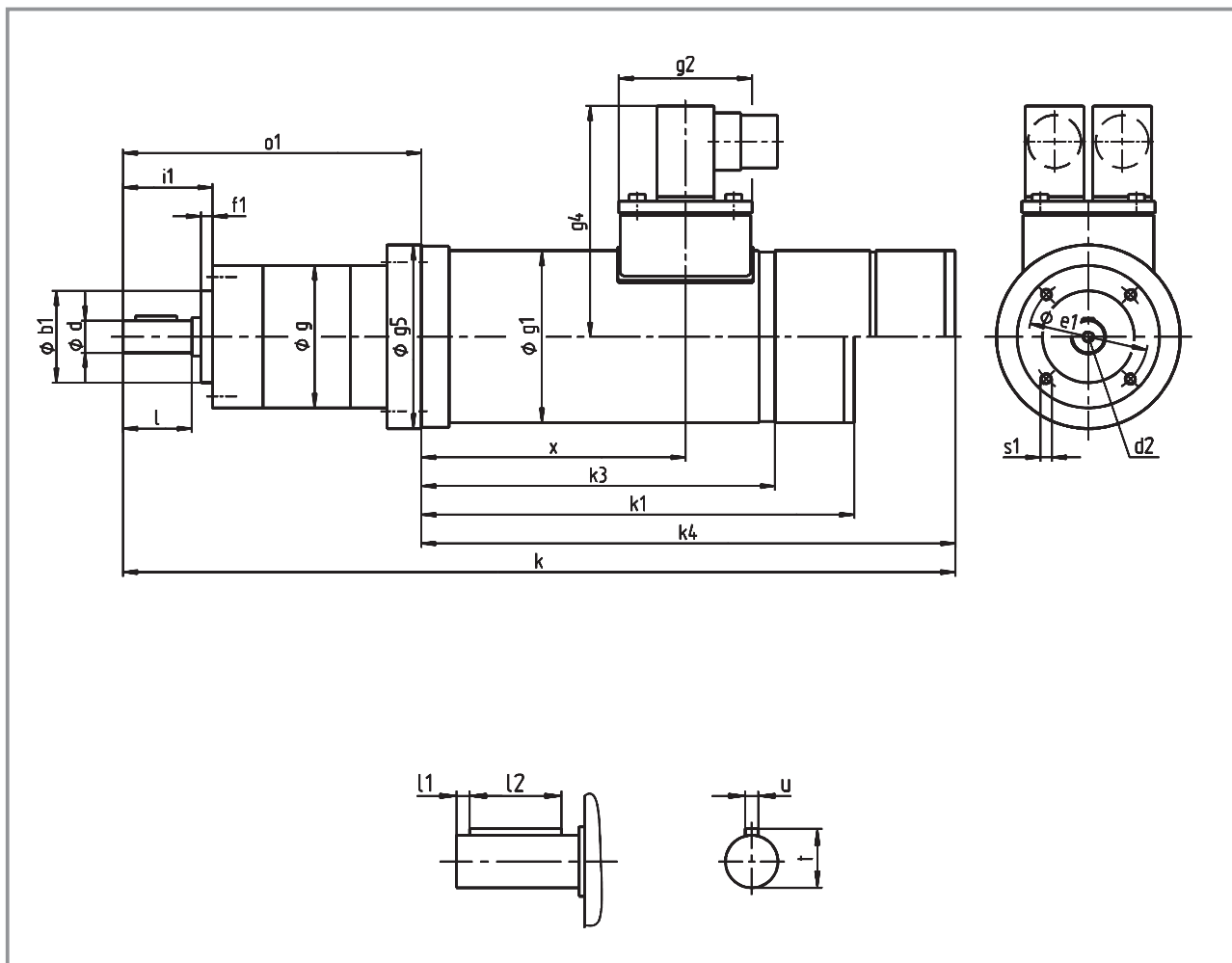
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Position of electrical connection		2

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type SPL62-□GVCR-047N22



Geared motor	Ratio i	b ₁ j7	d h7	d ₂	e ₁	f ₁	g	g ₁	g ₂	g ₄	g ₅	i ₁	k BS*
SPL62-□GVCR-047N22	3.7;6.7	40	14	M5	52	5	62	75	58	101	80	39	348
	14 ... 46												364
	51 ... 71												380

Geared motor	Ratio	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	o ₁	s ₁	t	u	x	Weight
SPL62-□GVCR-047N22	3.7;6.7	189	200	156	233	244	30	5.5	18	115	M5x10	16	5	115	3.8-4.8
	14 ... 46									131					4.2-5.2
	51 ... 71									147					4.6-5.6

Dimensions in mm

* see Page 8



Drive selection

Planetary geared servo motors SPL

Selection table for type SPL81-□GVCR-056N22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i 1-stage	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-056-22	450	730	4.74	4.22	3.700	
		400	8.64	2.31	6.750	
					i 2-stage	
		197	16.48	3.64	13.730	
		108	30.01	2.00	25.010	
		77	41.96	1.43	34.970	
		59	54.67	1.10	45.560	
					i 3-stage	
		53	57.00	2.11	50.890	
		38	79.70	1.51	71.160	
		27	111.44	1.08	99.500	
		22	120.00	0.86	123.970	

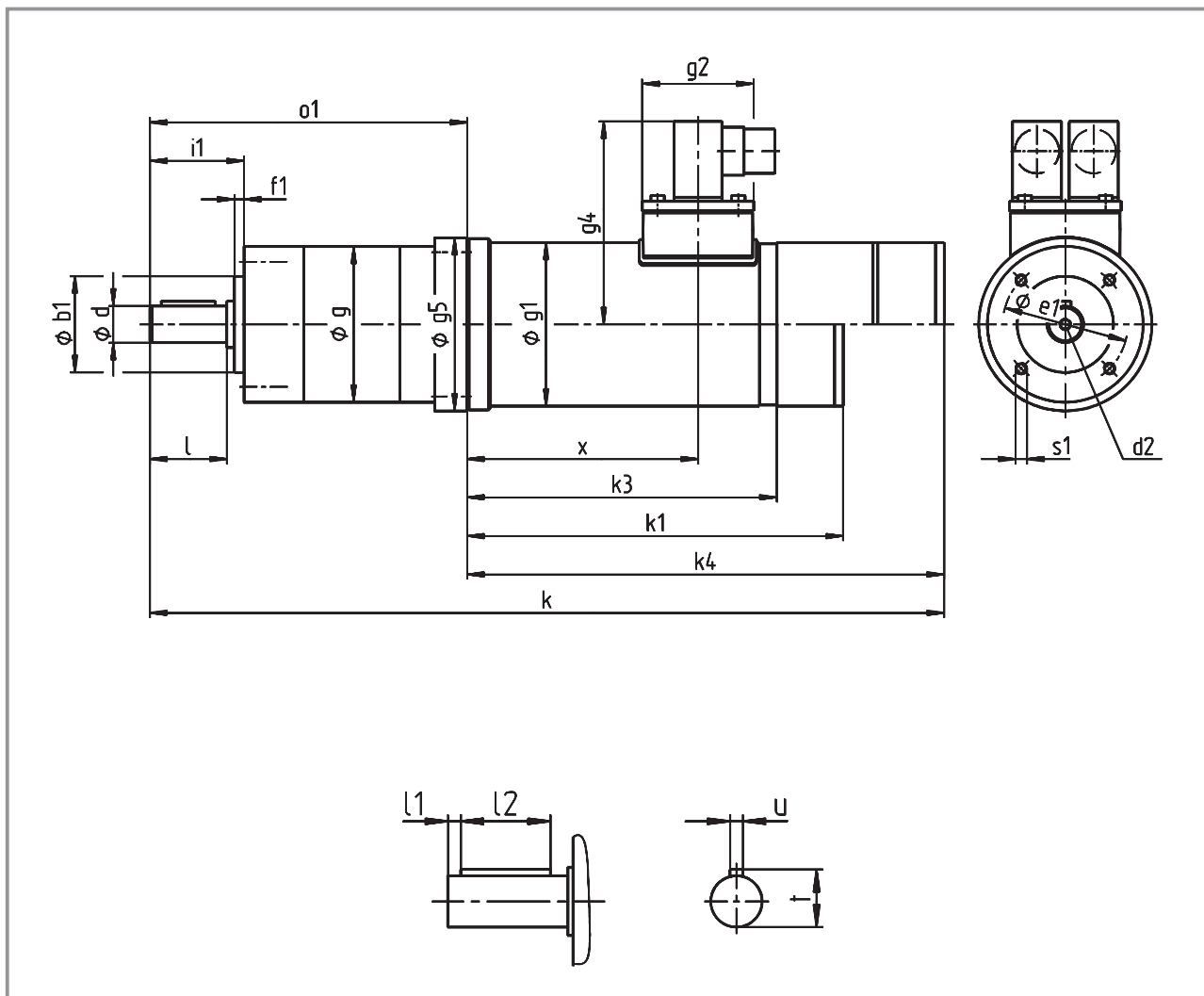
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Position of electrical connection		2

See page 9 for type code.
See page 10 for mounting position.



Selection table for type SPL81-□GVCR-056N22



Geared motor	Ratio i	b ₁ j7	d h7	d ₂	e ₁	f ₁	g	g ₁	g ₂	g ₄	g ₅	i ₁	k BS*
SPL81-□GVCR-056N22	3.7;6.7	50	19	M6	65	5	81	85	58	106	90	49	392
	14 ... 46												413
	51 ... 124												435

Geared motor	Ratio i	k ₁ RS*	k ₁ AG*	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	o ₁	s ₁	t	u	x	Weight
SPL81-□GVCR-056N22	3.7;6.7	196	207	163	248	260	40	6	28	144	M6x12	21.5	6	120	6.1-7.6
	14 ... 46									165					6.8-8.3
	51 ... 124									187					7.5-9.0

Dimensions in mm

* see Page 8



Drive selection

Helical geared servo motors GST

Selection table for type GST03-2GV□□-035C22

Motor type	P _N W	Supply voltage for Servo Drive = 24 or 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-035-22	140	1155.20	1.00	13.37	2.597	
		879.00	1.00	10.85	3.413	
		686.80	2.00	9.01	4.368	
		564.80	2.00	9.59	5.312	
		502.90	3.00	8.93	5.965	
		429.70	3.00	7.96	6.982	
		382.70	3.00	7.68	7.840	
		335.80	4.00	6.74	8.935	
		299.00	4.00	6.46	10.033	
		262.50	5.00	5.87	11.429	
		233.80	6.00	5.59	12.833	
		202.20	6.00	4.99	14.836	
		180.10	7.00	5.28	16.660	
		157.80	8.00	4.75	19.013	
		140.50	9.00	4.45	21.350	
		122.00	11.00	3.95	24.595	
		108.60	12.00	3.52	27.618	
		93.80	14.00	3.04	32.000	
		83.50	16.00	2.71	35.933	
		72.40	18.00	2.35	41.455	
		64.40	20.00	2.24	46.550	
		56.70	23.00	1.97	52.909	
		50.50	26.00	1.75	59.413	

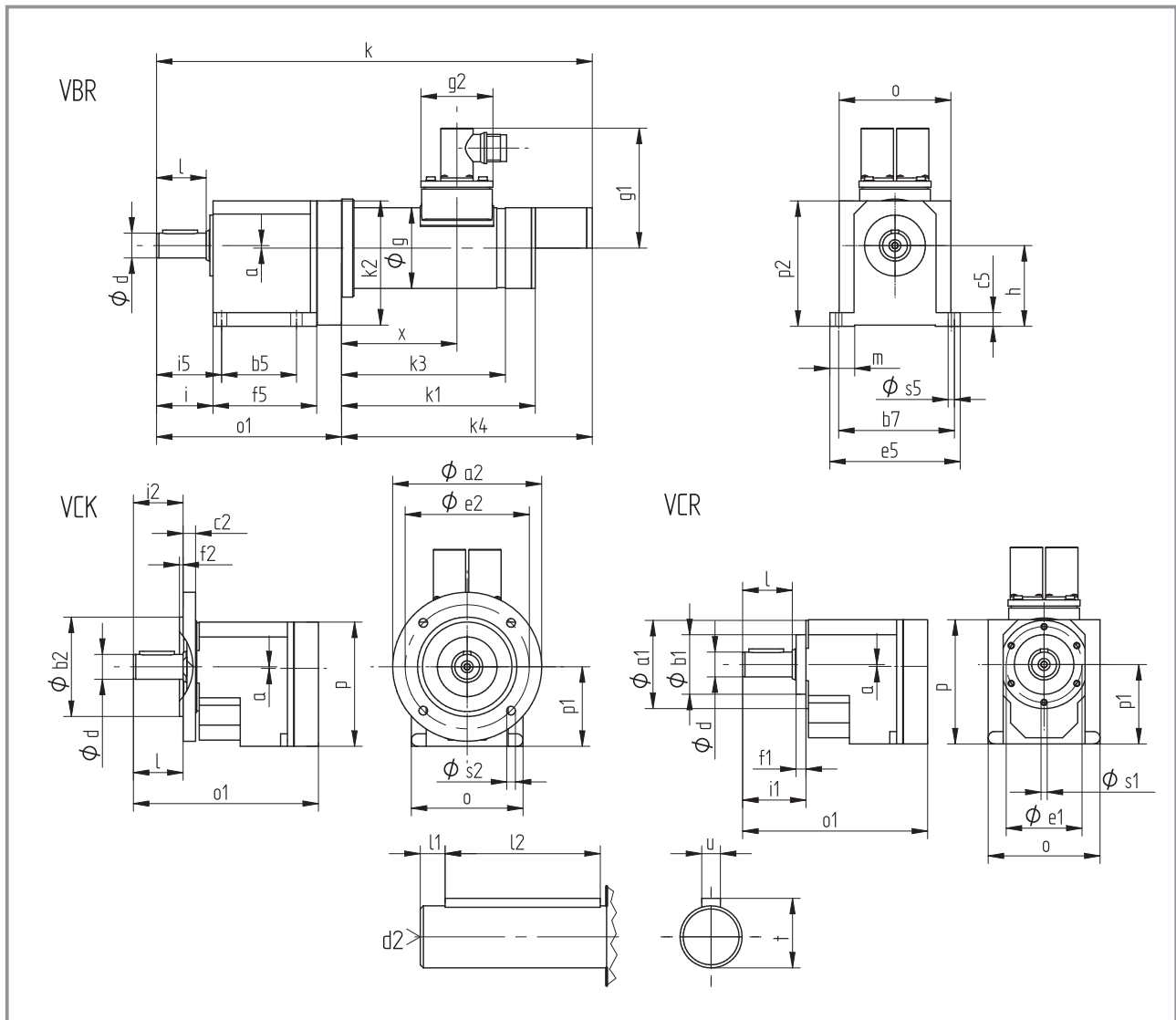
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
Gearbox design	VBR	
	VCR	
	VCK	
Output flange diameter	120 mm	
	140 mm	
	160 mm	
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type GST03-2GV□□-035C22



Geared motor	a	a ₁	a ₂	b ₁ h7	b ₂ j7	b ₅	b ₇	c ₂	c ₅	d	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i	i ₁	i ₂	i ₅
GST03-2GV□□-035C22			120		80					14	M5		100			3								28	40
	2	71	140	48	95	60	91	10	11	20	M6	61	115	105	8	3	84	65	95	58	65	46	51	40	52
			160		110								130			3.5									

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	o	o ₁	p	p ₁	p ₂	s ₁	s ₂	s ₅	t	u	x	Weight	
GST03-2GV□□-035C22	339.5							28	4	20			137.5					7						
	351.5	166.5	178	100	136	202	222.5	40	5	28	20	90	149.5	100	64	101	M5	9	6.6	22.5	6	93	5.0-6.5	
																		9						

Dimensions in mm

* see Page 8



Drive selection

Helical geared servo motors GST

Selection table for type GST03-2GV□□-047C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-047-22	210	962.60	2.00	7.52	2.597	
		732.50	3.00	6.10	3.413	
		572.30	3.00	5.07	4.368	
		470.60	4.00	5.39	5.312	
		419.10	5.00	5.02	5.965	
		358.10	5.00	4.48	6.982	
		318.90	6.00	4.32	7.840	
		279.80	7.00	3.79	8.935	
		249.20	8.00	3.63	10.033	
		218.70	9.00	3.30	11.429	
		194.80	10.00	3.15	12.833	
		168.50	11.00	2.81	14.836	
		150.10	13.00	2.97	16.660	
		131.50	15.00	2.67	19.013	
		117.10	16.00	2.50	21.350	
		101.60	19.00	2.22	24.595	
		90.50	21.00	1.98	27.618	
		78.10	25.00	1.71	32.000	
		69.60	28.00	1.52	35.933	
		60.30	32.00	1.32	41.455	
		53.70	36.00	1.26	46.550	
		47.30	41.00	1.11	52.909	
		42.10	45.00	1.00	59.413	

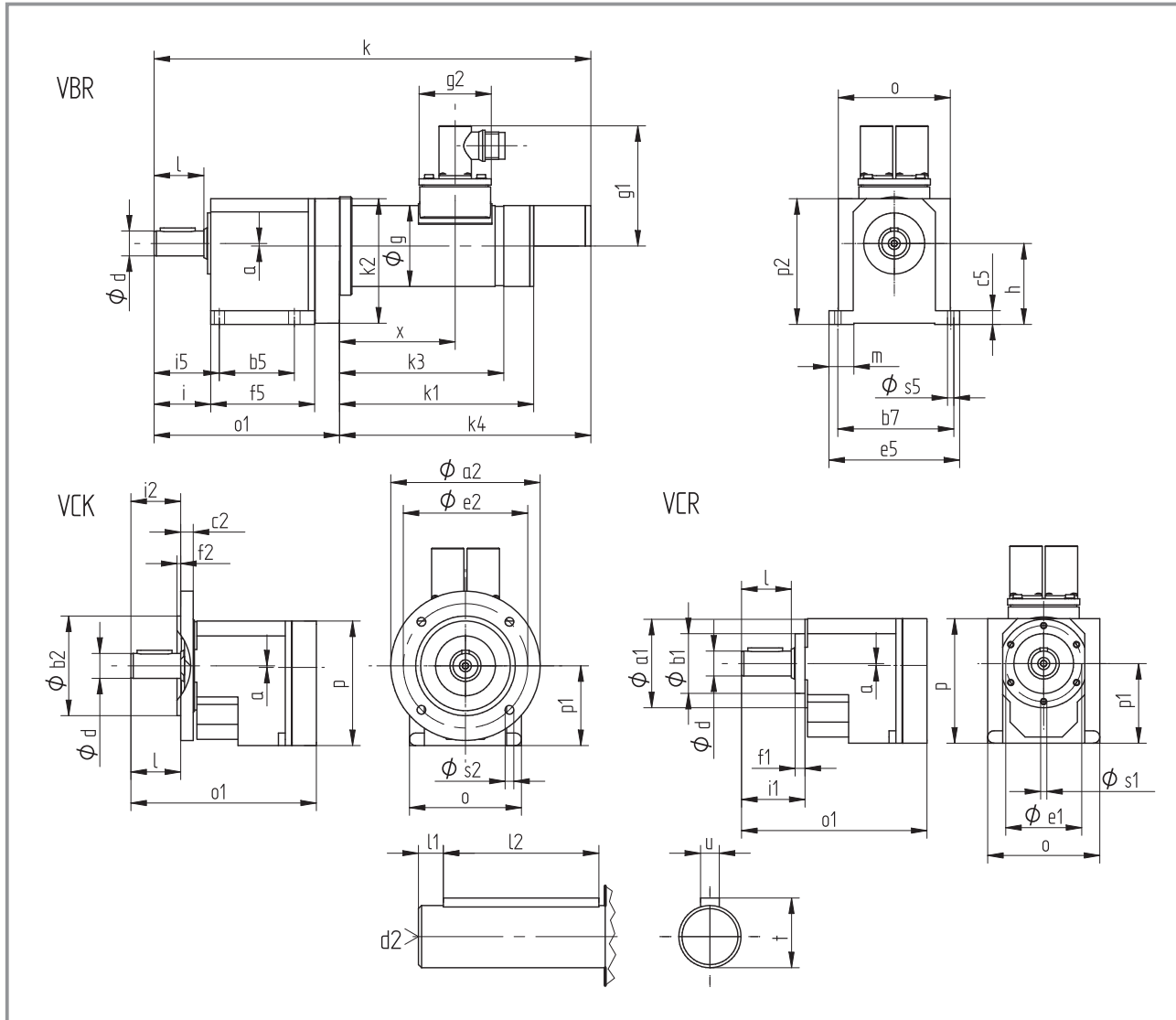
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VBR	
	VCR	
	VCK	
Output flange diameter	120 mm	
	140 mm	
	160 mm	
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type GST03-2GV□□-047C22



Geared motor	a	a ₁	a ₂	b ₁ h7	b ₂ j7	b ₅	b ₇	c ₂	c ₅	d	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i	i ₁	i ₂	i ₅
GST03-2GV□□-047C22			120		80					14	M5		100			3								28	40
	2	71	140	48	95	60	91	10	11	20	M6	61	115	105	8	3	84	75	101	58	65	46	51	40	52
			160		110								130			3.5									

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	o	o ₁	p	p ₁	p ₂	s ₁	s ₂	s ₅	t	u	x	Weight	
GST03-2GV□□-047C22	372.5							28	4	20			137.5					7						
	384.5	191	202.5	100	158.5	235	246.5	40	5	28	20	90	149.5	100	64	101	M5	9	6.6	22.5	6	117.5	6.0-7.5	
																		9						

Dimensions in mm

* see Page 8



Drive selection

Helical geared servo motors GST

Selection table for type GST04-1GV□□-056C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-056-22	450	1687.50	3.00	3.83	1.600	
		1318.40	3.00	3.74	2.048	
		1205.40	4.00	3.87	2.240	
		945.00	4.00	3.39	2.857	
		771.40	5.00	2.92	3.500	
		613.60	7.00	2.32	4.400	
		476.40	9.00	1.80	5.667	
		375.90	11.00	1.42	7.182	
		300.00	14.00	1.08	9.000	

Additional ordering details

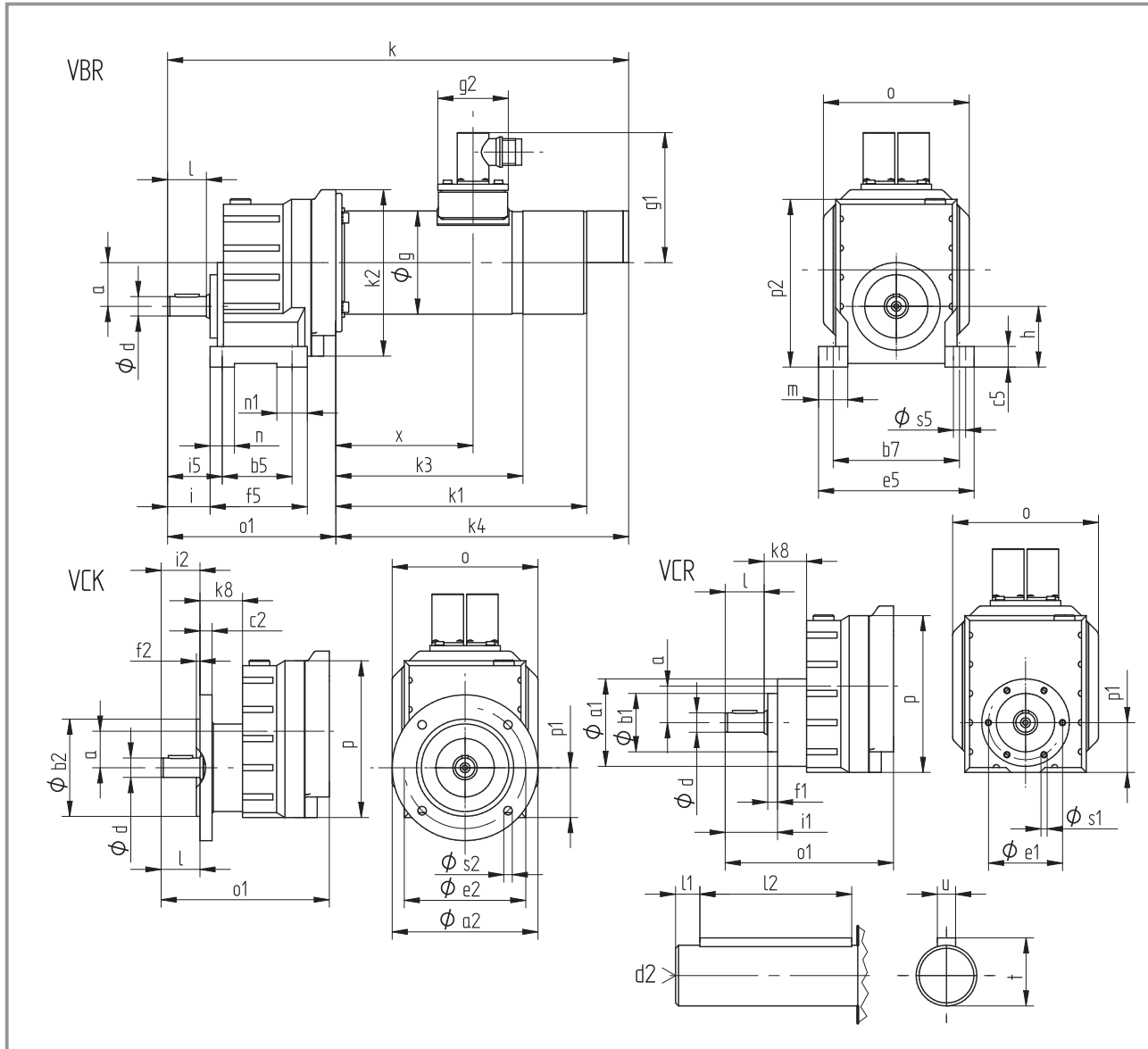
Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VBR	
	VCR	
	VCK	
Output flange diameter	120 mm	
	140 mm	
	160 mm	
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.

See page 10 for mounting position.



Dimensions for type GST04-1GV□□-056C22



Geared motor	a	a ₁	a ₂	b ₁ h ₇	b ₂ j ₇	b ₅	b ₇	c ₂	c ₅	d	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i	i ₁	i ₂	i ₅
GST04-1GV□□-047C22	36	72	120	48	80	55	105	10	17	16	M5	61	100	130	8	3	80	75	101	58	50	35	43	32	45
			140		95								115			3									
			160		110								130			3.5									

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	k ₈	l	l ₁	l ₂	m	n	n ₁	o	o ₁	p	p ₁	p ₂	s ₁	s ₂	s ₅	t	u	x	Weight
GST04-1GV□□-047C22	364.5	182	193	129	149	226	237	35	32	6	20	25	20	25	115	138.5	129	41	138	M5	7	9	18	5	103.5	6.5-8.0
																					9					
																					9					

Dimensions in mm

* see Page 8



Drive selection

Helical geared servo motors GST

Selection table for type GST04-2GV□□-056C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-056-22	450	913.40	5.00	3.88	2.956	
		810.10	5.00	3.91	3.333	
		666.20	6.00	3.86	4.053	
		590.70	7.00	3.87	4.571	
		520.50	8.00	3.82	5.187	
		461.50	9.00	3.83	5.850	
		421.90	10.00	3.66	6.400	
		383.50	11.00	3.40	7.040	
		337.50	12.00	3.13	8.000	
		299.70	14.00	2.95	9.010	
		273.90	15.00	2.80	9.856	
		241.10	17.00	2.28	11.200	
		214.80	19.00	2.32	12.571	
		189.00	22.00	1.79	14.286	
		175.30	24.00	2.16	15.400	
		154.30	27.00	1.70	17.500	
		139.50	30.00	1.75	19.360	
		122.70	34.00	1.35	22.000	
		108.30	38.00	1.38	24.933	
		95.30	44.00	1.08	28.333	
		85.40	49.00	1.10	31.600	
		75.20	47.00	0.86	35.909	
		68.20	54.00	0.88	39.600	
		60.00	52.00	0.75	45.000	

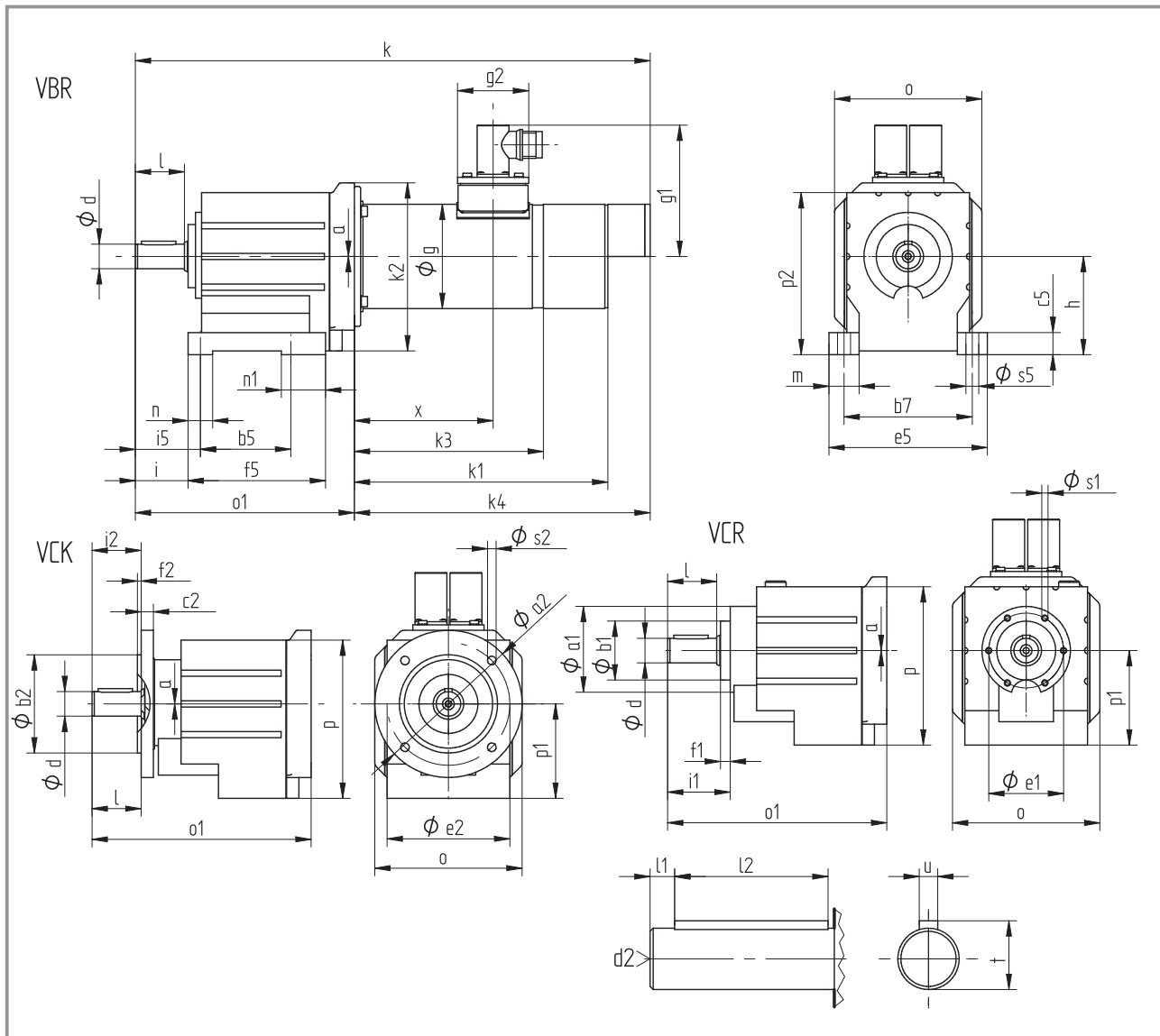
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VBR	
	VCR	
	VCK	
Output flange diameter	120 mm	
	140 mm	
	160 mm	
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type GST04-2GV□□-056C22



Geared motor	a	a ₁	a ₂	b ₁ h7	b ₂ j7	b ₅	b ₇	c ₂	c ₅	d k6	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i	i ₁	i ₂	i ₅
GST04-2GV□□-056C22	0	72	120	48	80	76	105	10	18	20	M6	61	100	130	8	3	112	85	106	58	80	43	51	40	53
			140		95								115			3									
			160		110								130			3.5									

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	n	n ₁	o	o ₁	p	p ₁	p ₂	s ₁	s ₂	s ₅	t	u	x	Weight
GST04-2GV□□-056C22	419.5	188.5	200	129	156	241	252.5	40	5	28	25	20	36	115	178.5	129	77	132	M5	7	9	22.5	6	113	9.5-11
																				9					
																				9					

Dimensions in mm

* see Page 8



Drive selection

Bevel geared servo motors GKR

Selection table for type GKR03-2G□A□-035C22

Motor type	P _N W	Supply voltage for Servo Drive = 24 or 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-035-22	140	554.40	2.00	13.83	5.411	
		482.20	3.00	12.41	6.222	
		421.90	3.00	11.51	7.111	
		366.80	3.00	10.30	8.178	
		329.60	4.00	9.51	9.101	
		286.60	4.00	8.27	10.466	
		257.70	5.00	7.44	11.64	
		224.10	6.00	6.47	13.386	
		198.50	6.00	5.73	15.111	
		172.60	7.00	4.98	17.378	
		154.90	8.00	4.47	19.365	
		134.70	10.00	3.89	22.27	
		119.80	11.00	3.92	25.051	
		104.10	12.00	3.41	28.808	
		92.00	14.00	3.01	32.593	
		80.00	16.00	2.62	37.481	
		71.10	18.00	2.49	42.222	
		61.80	21.00	2.17	48.556	
		55.70	23.00	1.95	53.889	
		48.40	26.00	1.70	61.972	

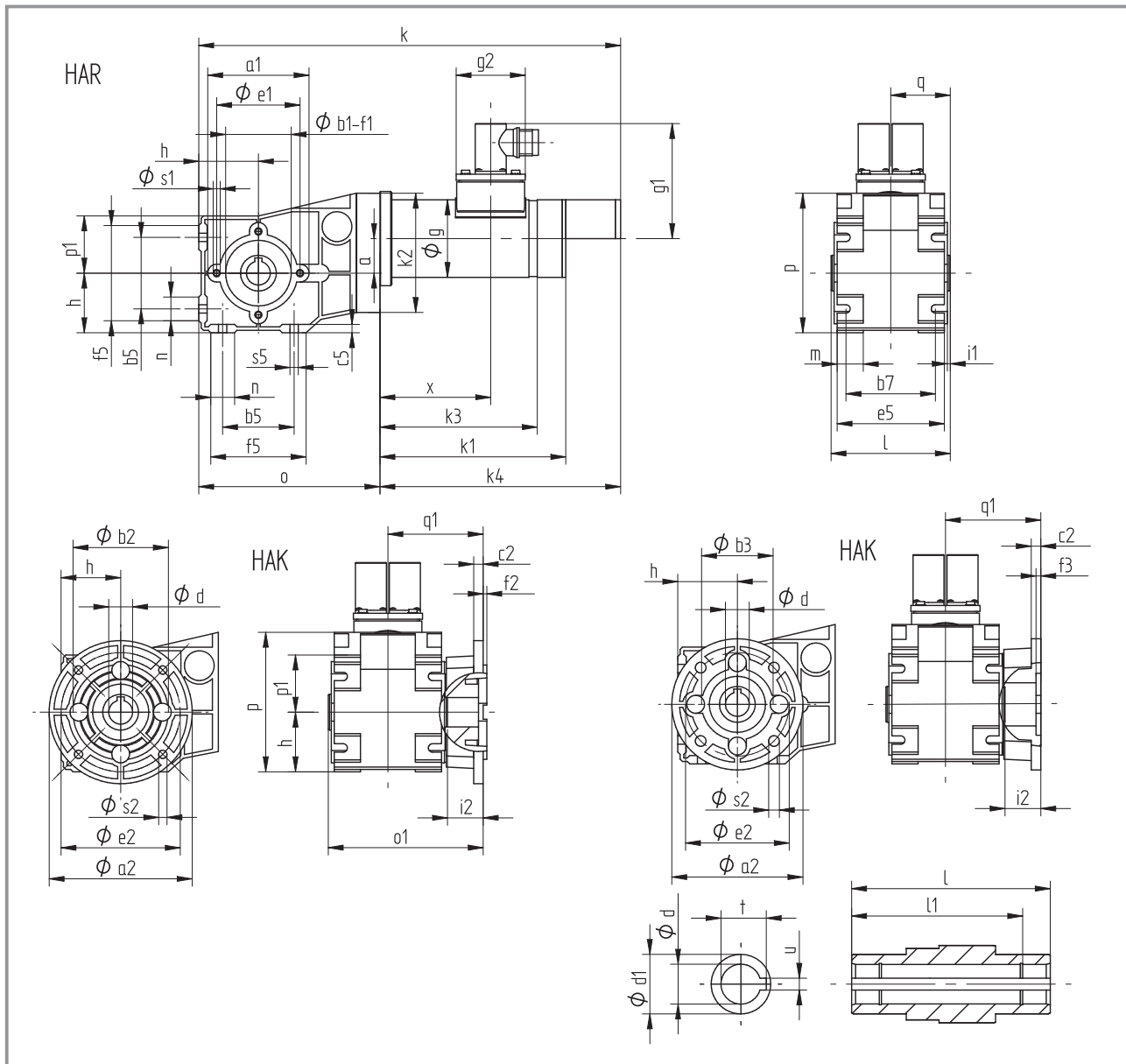
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VAR	
	VAK	
	HAR	
	HAK	
Output flange diameter	110 mm	
	120 mm	
Hollow shaft bore	18 mm	
	20 mm	
Shaft position on version VAR		3 5 8
Flange-shaft position on version VAK		3 5
Flange position on version HAK		3 5
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type GKR03-2GHA□-035C22



Geared motor	a	a ₁	a ₂	b ₁ J7	b ₂ j7	b ₃ H7	b ₅	b ₇	c ₂	c ₅	d H7	d ₁	e ₁	e ₂	e ₅	f ₁	f ₂	f ₃	f ₅	g	g ₁	g ₂	h	i ₁	i ₂	k BS*
GKR03-2GHA□-035C22	29	84	120	55	80	—	60	75	8	7	18	30	70	100	90	3	3	—	80	65	95	58	50	2.5	30	354
			110		—	60					20	30		87			4									

Geared motor	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	m	n	o	o ₁	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR03-2GHA□-035C22	166.5	178	100	136	202	222.5	100	86	22	20	152	130	117	48	50	80	M6	7	6.6	20.8	6	93	5.0-6.5
																		9		22.8	6		

Dimensions in mm

* see Page 8

The image contains technical drawings for two pump models, VAR and VAK, showing front, side, and detail views with various dimension labels.

VAR Model:

- Front View:** Shows dimensions a_1 , ϕe_1 , ϕb_1-f_1 , ϕs_1 , h , p_1 , b_5 , f_5 , n , s_5 , c_5 , o , k , g_2 , g_1 , k_2 , ϕg , x , k_3 , k_4 , b_5 , f_5 , o .
- Side View:** Shows dimensions q , p , m , b_7 , e_5 , l , i_1 , o_1 , ϕd .

VAK Model:

- Front View:** Shows dimensions h , ϕb_2 , ϕd , ϕs_2 , ϕe_2 , ϕa_2 .
- Side View:** Shows dimensions q_1 , i_2 , c_2 , f_2 , p_1 , h , o_2 , l .
- Detail View (Top):** Shows dimensions h , ϕb_3 , ϕd , ϕs_2 , ϕe_2 , ϕa_2 .
- Detail View (Side):** Shows dimensions q_1 , i_2 , c_2 , f_3 , l .
- Detail View (Bottom):** Shows dimensions l_1 , l_2 , d_2 .
- Detail View (Cross-section):** Shows dimensions u , l .

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	n	o	o ₁	o ₂	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR03-2GV□-035C22	354	166.5	178	100	136	202	222.5	40	5	28	22	20	152	138	168	117	48	90	80	M6	7	6.6	22.5	6	93	5.0-6.5
																					9			6		

* see Page 8



Drive selection

Bevel geared servo motors GKR

Selection table for type GKR03-2G□A□-047C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-047-22	210	462.00	4.00	7.78	5.411	
		401.80	5.00	6.98	6.222	
		351.60	5.00	6.48	7.111	
		305.70	6.00	5.79	8.178	
		274.70	7.00	5.35	9.101	
		238.90	8.00	4.65	10.466	
		214.80	9.00	4.18	11.64	
		186.80	10.00	3.64	13.386	
		165.40	11.00	3.22	15.111	
		143.90	13.00	2.80	17.378	
		129.10	15.00	2.51	19.365	
		112.30	17.00	2.19	22.27	
		99.80	19.00	2.21	25.051	
		86.80	22.00	1.92	28.808	
		76.70	25.00	1.70	32.593	
		66.70	28.00	1.47	37.481	
		59.20	32.00	1.40	42.222	
		51.50	37.00	1.22	48.556	
		46.40	41.00	1.10	53.889	
		40.30	45.00	0.96	61.972	

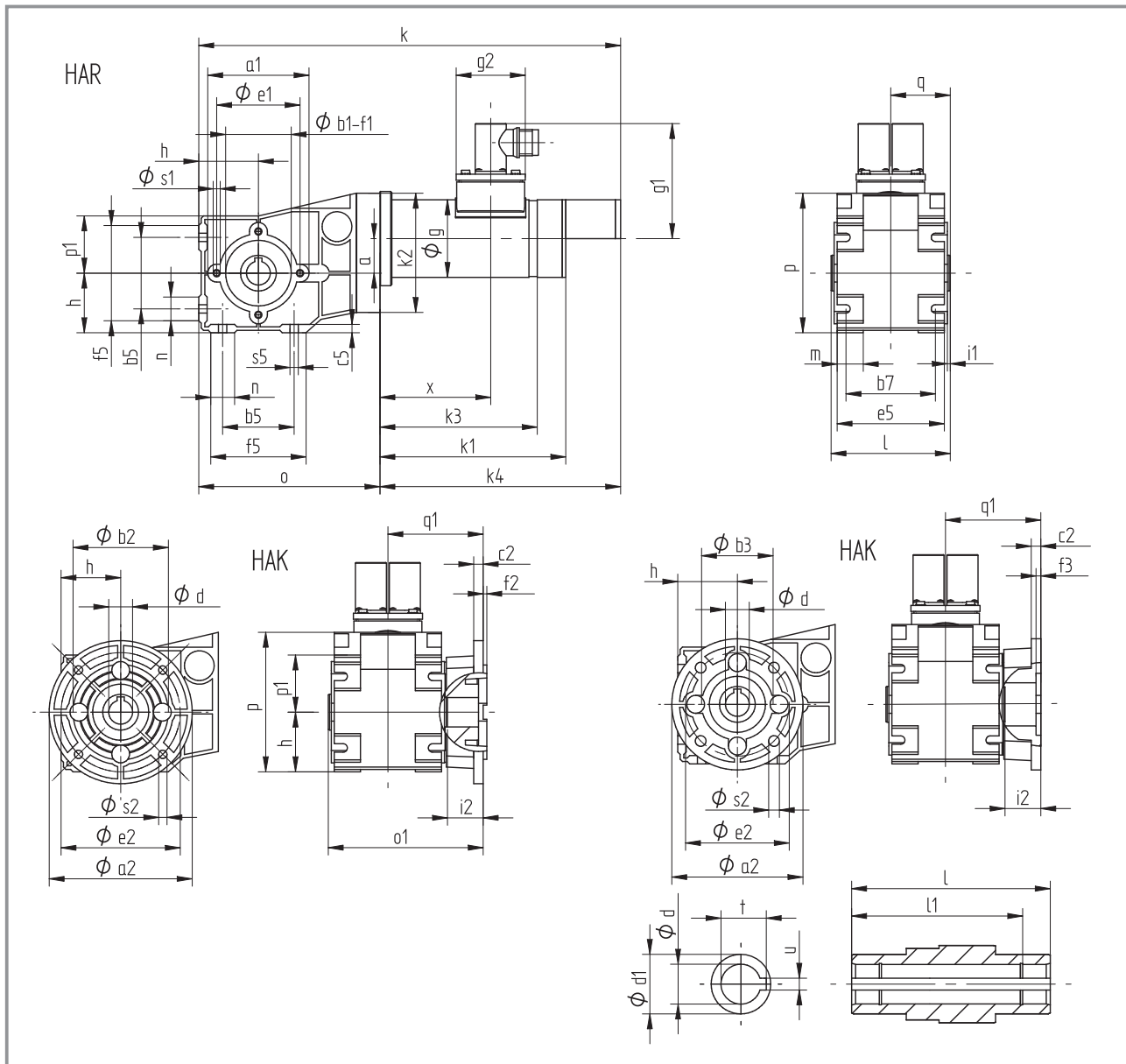
Additional ordering details

Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VAR	
	VAK	
	HAR	
	HAK	
Output flange diameter	110 mm	
	120 mm	
Hollow shaft bore	18 mm	
	20 mm	
Shaft position on version VAR		3 5 8
Flange-shaft position on version VAK		3 5
Flange position on version HAK		3 5
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.
See page 10 for mounting position.



Dimensions for type GKR03-2GHA□-047C22



Geared motor	a	a ₁	a ₂	b ₁ J7	b ₂ j7	b ₃ H7	b ₅	b ₇	c ₂	c ₅	d H7	d ₁	e ₁	e ₂	e ₅	f ₁	f ₂	f ₃	f ₅	g	g ₁	g ₂	h	i ₁	i ₂	k BS*
GKR03-2GHA□-047C22	29	84	120	55	80	—	60	75	8	7	18	30	70	100	90	3	3	—	80	75	101	58	50	2.5	30	387
			110		—	60					20	30		87			4									

Geared motor	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	m	n	o	o ₁	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR03-2GHA□-047C22	191	202.5	100	158.5	235	246.5	100	86	22	20	152	130	117	48	50	80	M6	7	6.6	20.8	6	117.5	6.0-7.5
																		9		22.8	6		

Dimensions in mm

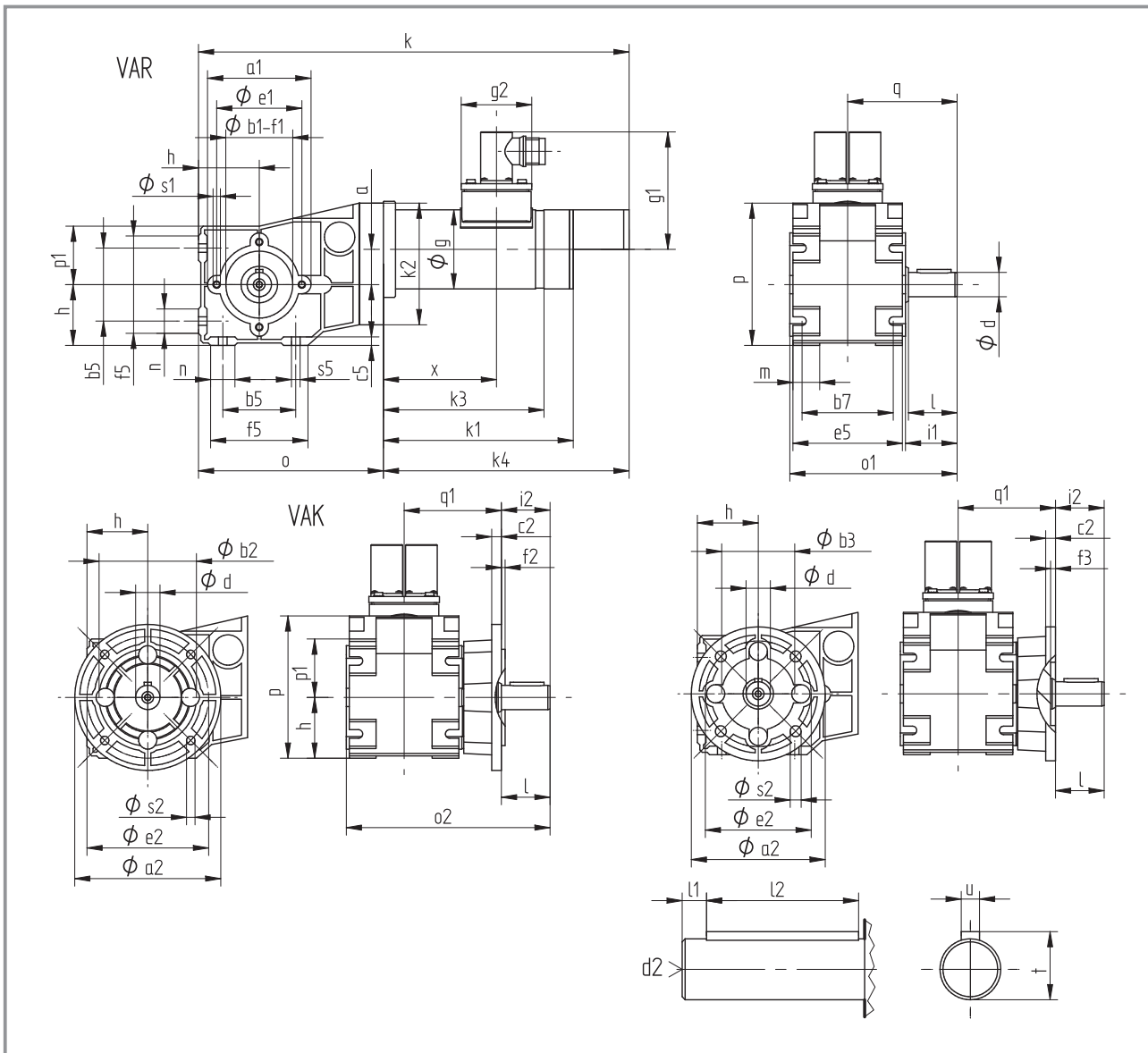
* see Page 8



Drive selection

Bevel geared servo motors GKR

Dimensions for type GKR03-2GVA□-047C22



Geared motor	a	a ₁	a ₂	b ₁ J7	b ₂ J7	b ₃ H7	b ₅	b ₇	c ₂	c ₅	d k6	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₃	f ₅	g	g ₁	g ₂	h	i ₁	i ₂
GKR03-2GVA□-047C22	29	84	120	55	80	—	60	75	8	7	20	M6	70	100	90	2.5	3	—	80	75	101	58	50	42.5	40
			110		—	60									87			4							

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	n	o	o ₁	o ₂	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR03-2GVA□-047C22	387	191	202.5	100	158.5	235	246.5	40	5	28	22	20	152	138	168	117	48	90	80	M6	7	6.6	22.5	6	117.5	6.0-7.5
																					9			6		

Dimensions in mm

* see Page 8



Drive selection

Bevel geared servo motors GKR

Selection table for type GKR04-2G□A□-056C22

Motor type	P _N W	Supply voltage for Servo Drive = 48 V DC			i	Selection of Please mark as appropriate
		n ₂ rpm	M ₂ Nm	c		
SDSGS□□-056-22	450	520.70	8.00	3.86	5.185	
		452.80	9.00	3.80	5.963	
		379.70	11.00	3.77	7.111	
		330.20	12.00	3.80	8.178	
		296.70	14.00	3.82	9.101	
		258.00	16.00	3.62	10.466	
		235.80	17.00	3.36	11.449	
		212.60	19.00	3.03	12.698	
		184.90	22.00	2.63	14.603	
		173.60	24.00	2.47	15.556	
		150.90	27.00	2.15	17.889	
		138.10	30.00	1.96	19.556	
		120.10	34.00	1.71	22.489	
		107.20	38.00	1.73	25.185	
		93.20	44.00	1.51	28.963	
		84.60	49.00	1.37	31.919	
		73.60	56.00	1.19	36.707	
		67.50	61.00	1.09	40.000	
		58.70	70.00	1.03	46.000	

Additional ordering details

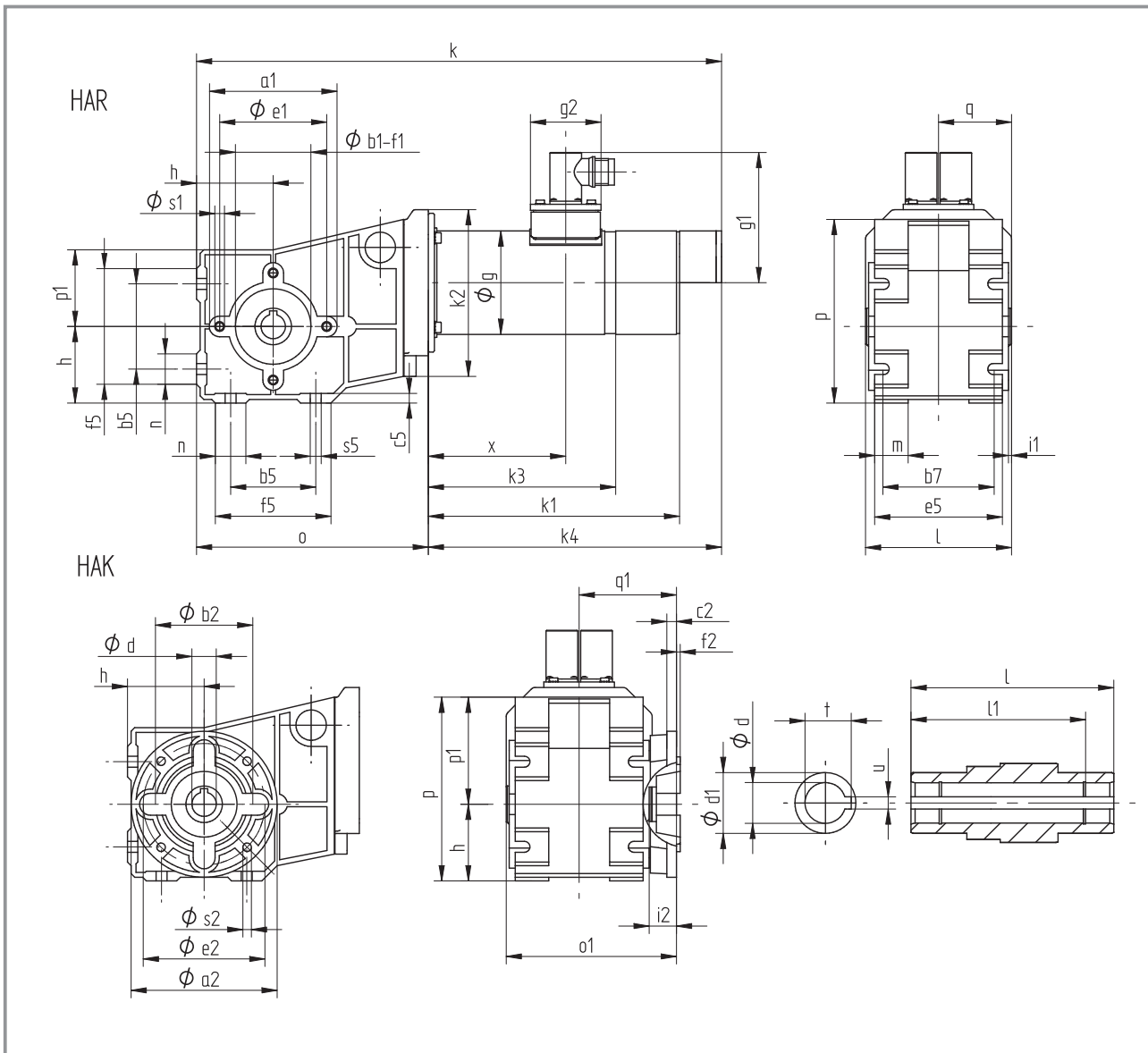
Enclosure	IP54	
	IP55	
Design of B-side	with resolver	
	with spring-applied brake and resolver	
	with permanent magnetic brake and resolver	
	with single-turn absolute value encoder	
	with multi-turn absolute value encoder	
	with spring-applied brake and single-turn absolute value encoder	
	with spring-applied brake and multi-turn absolute value encoder	
	with permanent magnetic brake and single-turn absolute value encoder	
	with permanent magnetic brake and multi-turn absolute value encoder	
Gearbox design	VAR	
	VAK	
	HAR	
	HAK	
Output flange diameter	120 mm	
	160 mm	
Hollow shaft bore	20 mm	
	25 mm	
Shaft position on version VAR		3 5 8
Flange-shaft position on version VAK		3 5
Flange position on version HAK		3 5
Mounting position		A B C D E F
Position of electrical connection		2 3 4 5

See page 9 for type code.

See page 10 for mounting position.



Dimensions for type GKR04-2GHA□-056C22



Geared motor	a	a ₁	a ₂	b ₁ J7	b ₂ j7	b ₅	b ₇	c ₂	c ₅	d H7	d ₁	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i ₁	i ₂
GKR04-2GHA□-056C22	36	104	120	62	80	70	90	8	8	20	30	88	100	105	3	3	95	85	106	58	63	2.5	20
			160		110					25	35		130			3.5							

Geared motor	k BS*	k ₁ RS*	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	m	n	o	o ₁	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR04-2GHA□-056C22	431.5	188.5	200	129	156	241	252.5	120	106	28	25	190.5	140	151	63	60	80	M8	7	9	22.8	6	113	8.5-11
																			9		27	8		

Dimensions in mm

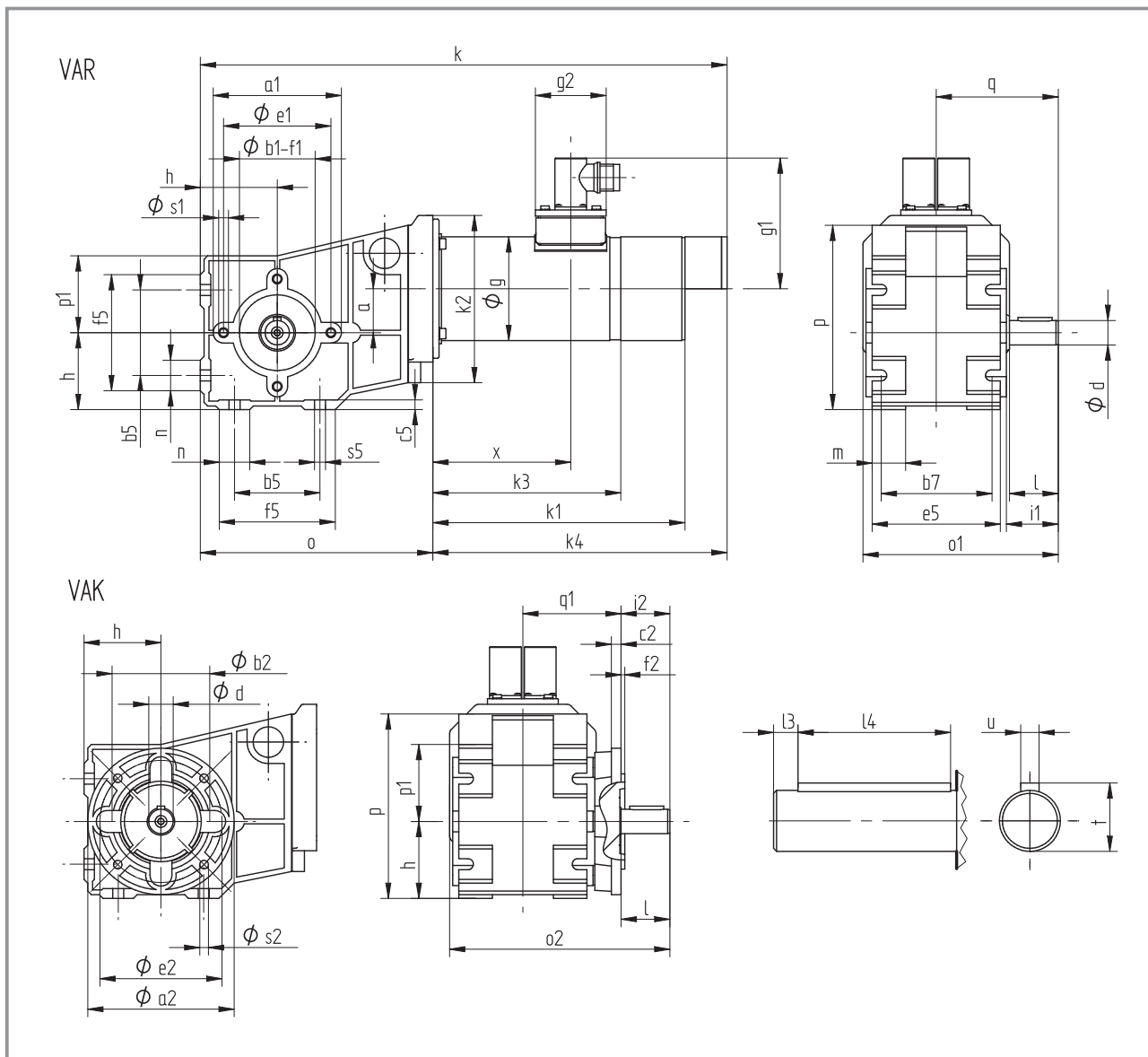
* see Page 8



Drive selection

Bevel geared servo motors GKR

Dimensions for type GKR04-2GVA□-056C22



Geared motor	a	a ₁	a ₂	b ₁ J7	b ₂ J7	b ₅	b ₇	c ₂	c ₅	d k6	d ₂	e ₁	e ₂	e ₅	f ₁	f ₂	f ₅	g	g ₁	g ₂	h	i ₁	i ₂	k BS*	k ₁ RS*
GKR04-2GVA□-056C22	36	104	120	62	80	70	90	8	8	20	M6	88	100	105	3	3	95	85	106	58	63	42.5	20	431.5	188.5
			160		110								130			3.5									

Geared motor	k ₁ AG*	k ₂	k ₃	k ₄ BS*	k ₄ BA*	l	l ₁	l ₂	m	n	o	o ₁	o ₂	p	p ₁	q	q ₁	s ₁	s ₂	s ₅	t	u	x	Weight
GKR04-2GVA□-056C22	200	129	156	241	252.5	40	5	28	28	25	190.5	140	168	151	63	60	80	M8	7	9	22.8	6	113	8.5-11
																			9		27	8		

Dimensions in mm

* see Page 8