Technical data

System specifications

Application

The Rexroth transfer systems all form a program of fine-tuned mechanical components that are used to convey, separate, and position workpiece pallets. With these components, you can create almost any system layout you need. The systems are primarily used to convey workpieces (on Rexroth workpiece pallets) to and from manual or automatic work stations on an assembly line.

Planning

Transfer system planning, setup, initial start-up and maintenance should only be done by trained personnel. Rexroth offers training courses for this.

Scope of delivery – small parts

The sensors, pneumatic valves, and electrical and pneumatic installation material that are necessary for operation are usually not included in the scope of delivery. These parts are only preassembled if they guarantee special functional safety or if installing them at a later point would require too much effort.
Please note the references for the required flow control valves and check valves in the pneumatic switching plan (listed in the assembly and operation instructions) must be followed.

Note

Examples
Installation references, pneumatic switching plans and typical function processes are described in the catalogs and assembly instructions. These must be followed when setting up and starting the initial operation of the system.

CE identification, responsibility

Components that fall under the EC Machinery Directive are delivered with the corresponding manufacturer's declaration. Overall responsibility for system safety (declaration of conformity, CE identification) lies with the system builder. The references in the assembly instructions and in the Instructions for Employees on Safety – 3 842 527 147 must be followed.

Materials used

The materials used in the components are primarily:
- Non-rusting steel or steel protected against corrosion by a special surface,
- Brass,
- Cast or malleable aluminum alloys,
- Polyurethane, polyamide, in some cases with additives to improve electrical and mechanical characteristics, and UHMW polyethylene.
- NBR or Viton for elastic seals.

Media resistance

Resistant to many common media used in production such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, e.g. test oil, doped oils, aggressive detergents, solvents, or brake fluid.
Avoid prolonged contact with highly reactive acidic or alkaline materials.

Contamination

Wear may increase dramatically if the system is contaminated, particularly with abrasive media from the surrounding area such as sand and silicates from construction, but also due to processes running on the transfer system (e.g. welding beads, pumice dust, glass shards, shavings, or lost parts, etc.). In such cases, maintenance intervals must be substantially shortened.

Such cases require special attention when planning the system and adjusting the maintenance intervals.

Functional safety

Resistance to media and contamination does not mean that functional safety is guaranteed in every case.
- Liquids that thicken on evaporation and are highly viscous or adhesive (sticky) could lead to a disruption in function.

- Media with lubricating properties may reduce the driving power transferred by friction if they are carried over onto systems with rollers.

Environmental sustainability, recycling

The materials used are environmentally friendly.
They can be recycled or reused (components may have to be processed and replaced). Recyclability is ensured by the selection of materials and the ability to take the components apart.

Pneumatic connection data

Oiled or non-oiled, filtered, dry compressed air.
Operating pressure 6 bar Performance data is for an operating pressure of 6 bar.

Maintenance

The TS components require very little maintenance. Maintenance instructions are included in the operating manual.

Wear

Wear is caused by the basic principle of this system and cannot be avoided. Design measures and appropriate materials help ensure functional safety over the life of the product. However, wear depends on the operating, maintenance, and ambient conditions of the system and the location (resistance, contamination).

Measures to reduce wear

The following measures reduce wear and the friction caused by it:

- Switch off conveyor sections when the system is not running, e.g. during breaks, overnight, on the weekend.
- Only select speeds that correspond with the particular function.
- Minimize the weight of the workpiece pallet – do not overload workpiece supports with material.
- Avoid unnecessary accumulation sections, e.g. by reducing the number of workpiece pallets
- Switch off accumulation sections carrying heavy workpiece pallets as long as transport is not necessary.
- Very important: Avoid contamination by abrasive media or reduce contamination through regular cleaning.

Load specifications

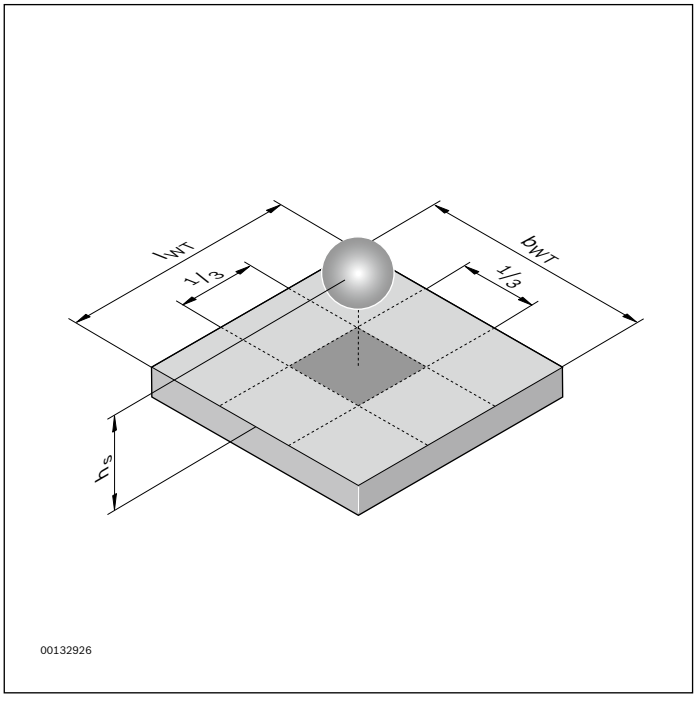
Permitted loads apply for conveyor sections only under the condition that workpiece pallets with the maximum permitted weight have accumulated.
Accumulation operation is not permitted at curves, diverters, junctions, or the positioning unit.

Wear and conveyor speed

Nominal data for the permitted workpiece pallet weight describe operation with standard speeds and normal operating conditions.
Wear on the workpiece pallet wear pads and the conveyor medium will not influence system function throughout the service life.

Loading the workpiece pallet, gravity center position

Concentric load with a low center of gravity is generally preferable. Incorrect load distribution with a high and/or eccentric gravity center on the workpiece pallet may have a negative influence on running and safety.
Pay attention when arranging workpiece supports and workpieces on the pallet that the center of gravity of the loaded workpiece pallet is within the area 1/3 of the length or width from the center of the workpiece pallet. The maximum height of the center of gravity over the conveying level should not exceed 1/2 of the workpiece pallet length or width.



Loading the workpiece pallet, combination of empty and loaded workpiece pallet

When setting up and testing the modular units, the workpieces pallets should not all have the same weight on the conveyor sections, i.e. full and empty pallets should all come through the circuit.
Extreme differences in weight may require special measures to avoid functional disruptions. This applies, e.g. to the permitted accumulation length before stop gates, for the function of dampers and dampened stop gates.
Function is usually not limited if the weight ratio is 2:1 between heavy workpiece pallets (loaded with a workpiece) and light workpiece pallets (empty).

Loading the workpiece pallet, minimum weights

The minimum weight of the workpiece pallet is generally not relevant. In special cases, depending on the marginal conditions, an application-specific minimum weight may be required for safe and continuous transport. This can occur, for example, if switching elements have to be manually operated (e.g. on a rocker), or if a light workpiece pallet does not run smoothly when changing directions. In such unusual cases, additional weight should be added when designing the workpiece pallet.

Overloading

Overloading the conveyor line can cause the conveyor medium to fail and motors and gears to fail prematurely. When overloading of pneumatic components occurs function cannot be guaranteed.

Transportation speed, dynamic influences

When the conveying speed increases, bumps when changing directions and the rebound force on the stop gates also increase. This may require longer damping periods or shock absorbers before the next movement.

Drive data

Definition of the basic principles of motor specifications
The specified performances, torques and revolutions per minute are rounded values and apply to:

- operating time/day = 8 h (100% switched-on time)
- uniform operation (continual), no, or very light, impacts in a direction of rotation at 10 switching cycles/hour
- installation positions and designs described in the catalog
- maintenance-free gears with life-long lubrication,
- ambient operating temperature 0 ... 60 °C. Gear unit with life-long lubrication for ambient operating temperature ≤0 °C available on request
- Protection class IP 55
- f_{mains} = 50 Hz constant
- T_U = 20 °C for gears
  T_U = 40 °C for motors
- Installation altitude ≤ 1,000 m above mean sea level
- Overloading the drive reduces its service life.
  10% overloading: = 75% service life
  20% overloading: = 50% service life

In the case of other operating conditions, the achievable values may differ from those stated.
In the case of extreme operating conditions, please consult your distribution partner.

Motor data

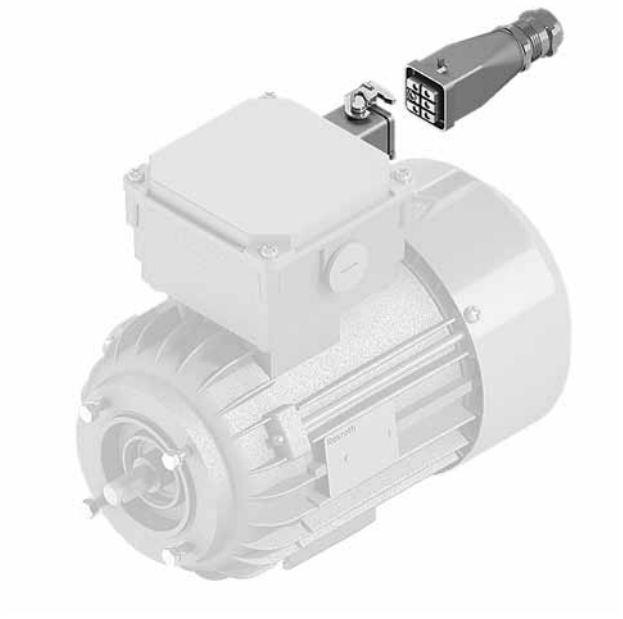
Electrical connection requirements:
Connection to a 3-phase, 5-wire system (L1, L2, L3, N, PE), a connection plan is included in the terminal box.
All motors are equipped with a thermal contact*), which has to be connected to an overload switch-off.

*) Bi-metal thermal contact, triggered at 150 °C ±5 °C
Resistance thermal contact provided on request.

Drive motors with frequency converters (FU) can only be operated with 380 V ... 500 V voltage.

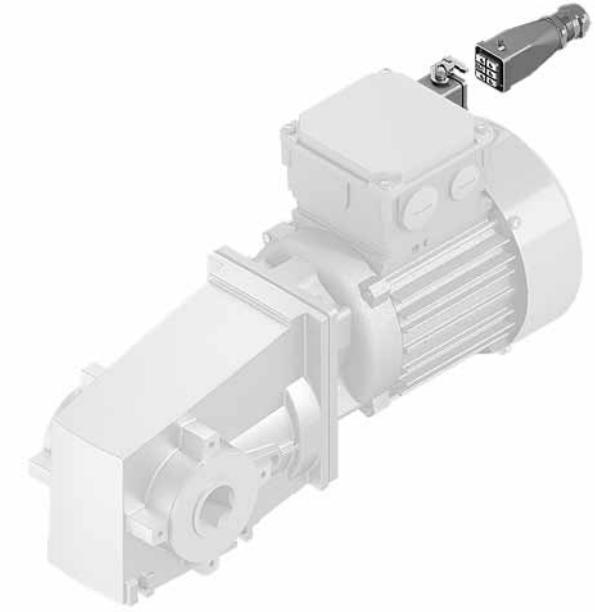
All of the motors comply with protection type IP 55.

Motor types without Index b



Motor connection with plug (AT = S) and 3A metal industrial plug-in connector for motor types without Index b, e.g. 714

Motor types with Index b



Motor connection with plug (AT = S) and 3A metal industrial plug-in connector for motor types with Index b, e.g. B. 714b

Motor data (GM = 1)

Transport and nominal speed v_N

The transport speed v_N is specified for the rated output and frequencies of 50 Hz or 60 Hz.

The actual values v vary depending on:

- Tolerance of the standard motors
- Performance range of the motors
- Load on the conveyor section

		400 V/50 Hz						400 V/60 Hz					
	v_N (m/min)	v[1] (m/min)	i	n1[2] (rpm)	n2[3] (rpm)	P[4] (W)	Type	v[1] (m/min)	i	n1[2] (rpm)	n2[3] (rpm)	P[4] (W)	Type
AS 5/XH AS 5/H AS 5/ OC	2	2.10	60.00	670	11	120	60/738b	2.53	60.00	804	13.4	120	60/738b
	4	4.21	60.00	1,340	22	250	60/714b	3.20	60.00	1,020	17.0	250	60/716b
	6	5.39	47.88	1,370	29	370	37/734b	6.47	47.88	1,644	34.3	370	37/734b
	9	8.80	29.33	1,370	47	370	29/734b	10.56	29.33	1,644	56.1	370	29/734b
	12	11.06	23.33	1,370	59	370	23/734b	13.28	23.33	1,644	70.4	370	23/734b
	15	13.55	19.05	1,370	72	370	19/734b	16.26	19.05	1,644	86.3	370	19/734b
	18	16.59	15.56	1,370	88	370	15/734b	19.15	15.56	1,644	105.6	370	15/734b
HQ 5	6 (b = 455 mm)	6.01	30	1,400	46.67	90	30/524	5.69	38	1,680	44.21	100	38/524
	6 (b = 650/845 mm)	6.01	30	1,400	46.67	180	30/624	5.41	40	1,680	42	220	40/624
	9 (b = 455 mm)	9.02	20	1,400	70	90	20/524	9.02	24	1,680	70	100	24/524
	9 (b = 650/845 mm)	9.02	20	1,400	70	180	20/624	8.66	25	1,680	67.2	220	25/624
	12 (b = 455 mm)	12.02	15	1,400	93.33	90	15/524	10.82	20	1,680	84	100	20/524
	12 (b = 650/845 mm)	12.02	15	1,400	93.33	180	15/634	10.82	20	1,680	84	220	20/624

1) Transport speeds at other voltages/frequencies provided on request.
2) n1 = motor speed
3) n2 = gear output speed
4) Motor output

AS 5/XH, AS 5/H technical data:
Max. torque limit: 45 Nm (toothed belt) limit
Toothed belt drive gear ratio: 1:1
Flange ø: 75 mm
Drive shaft: SW27
Conveyor roller ø: 60 mm

Country applicability

	Europe	Switzerland	USA	Canada	Brazil	Australia	New Zealand	South Korea	China	India
Line voltage (3x....)	400 V	400 V	480 V[1]	480 V[1] 575 V	220 V 380 V[3] 440 V[1]	400 V 415 V[2]	400 V 415 V[2]	220 V 380 V[3] 440 V[1]	380 V[2]	415 V[2]
Line voltage tolerance	±10%	±10%	±10%	±10%	±10%	±5%	±5%			±5%
Line frequency	50 Hz	50 Hz	60 Hz	60 Hz	60 Hz	50 Hz	50 Hz	60 Hz	50 Hz	50 Hz

1) ~ 460 V / 60 Hz
2) ~ 400 V / 50 Hz
3) ~ 400 V / 60 Hz

Motor data

Performance data

Note: The data is typical values. We reserve the right to make changes. See motor type plate for official data. Please note the country assignment.

Voltage class	**A**	**A**	**B**	**D**
Circuit	**Δ**	**Y**	**Y**	**Y**
Voltage U at f = 50 Hz	200 V ±10%		400 V ±10%	
	200 V ±10%		400 V +10...-12%	
Voltage U at f = 60 Hz	220 V ±10%	400 V ±10%	460 V ±10%	575 V ±10%
	220 V ±10%	400 V ±10%	460 V +10...-12%	575 V ±10%

			Current consumption at rated power				**Power factor**	**Power output for**	
	Motor type	**IE3**	**I_N** (A)	**I_N** (A)	**I_N** (A)	**I_N** (A)	**cos ϕ**	**(50 Hz) P** (kW)	**(60 Hz) P** (kW)
	524	x	0.65	0.35	0.32	0.24	0.6	0.09	0.1
	614b	–	–	–	0.49	–	0.56	0.12	0.14
	624	x	1.15	0.65	0.55	0.45	0.66	0.18	0.22
	634	x	1.65	0.9	0.85	0.65	0.6	0.25	0.29
	644b	–	–	–	–	0.75	0.6	0.25	0.29
	714b	–	1.75	1	0.8	–	0.64	0.25	0.3
	716b	–	1.45	0.85	0.6	0.55	0.66 ... 0.68	0.18	0.22
	716	x	1.3	0.75	0.6	0.62	0.68	0.18	0.22
	734b	–	2.3	1.35	0.95	0.95	0.72 ... 0.77	0.37	0.45
	734	x	1.9	1.05	0.95	0.72	0.74	0.37	0.42
	734a	x	2.5	1.4	1.3	1	0.66	0.45	0.52
	738b	–	1.4	0.8	0.55	0.5	0.60 ... 0.63	0.12	0.14
	744b	–	–	–	1.4	–	0.77	0.55	0.68
	814b	–	3	1.75	–	1.27	0.68 ... 0.69	0.55	0.64
	814	x	3.1	1.7	1.45	1.1	0.69	0.55	0.63
	824	x	4.1	2.25	2	1.6	0.66	0.75	0.86

Suitable for continuous operation, start-stop operation with an operating time of up to 70% and frequency converter operation.

Certification for the motor, cable and plug components:

IE3 motors: CE, cURURS, CCC

Motors with Index b: CE/CCC (50 Hz), CE/cURUS (60 Hz)

3-phase motors	
T_U (°C)	**P_V / P_N**
< 40	1[1)]
45	0.95
50	0.90
55	0.85
60	0.8

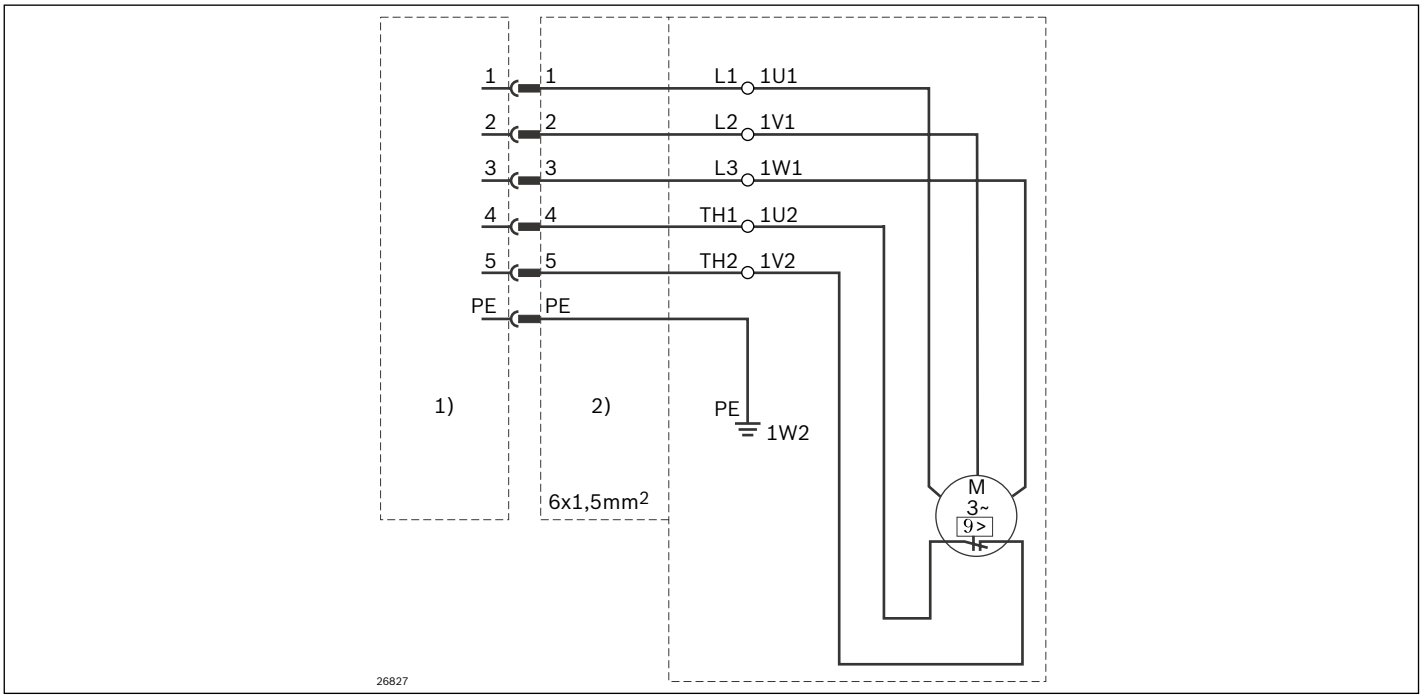
[1)] Rated motor power (0.37; 0.25; 0.12 kW)

Rated motor power

The ambient operating temperature T_U influences the rated power P_N of the gear motors.

Motor connection

Motor connection with cable/plug (AT = 1), circuit diagram



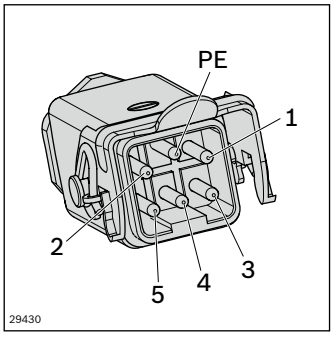
1) Connection cable side

2) Motor side

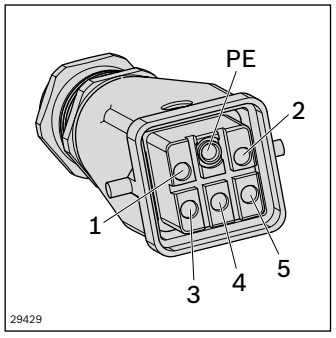
The plug connection consists of UL components.

Connection list

Connection terminals, motor 3~	Pin no.	Code
U1	1	L1
V1	2	L2
W1	3	L3
TW1	4	Th1
TW2	5	Th2
	PE	PE



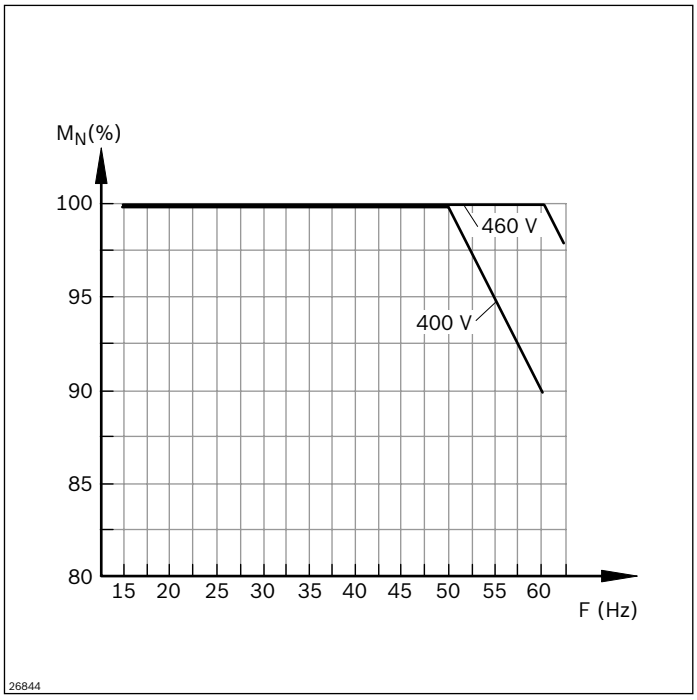
Motor side



Connection cable side

Frequency converter (FU)

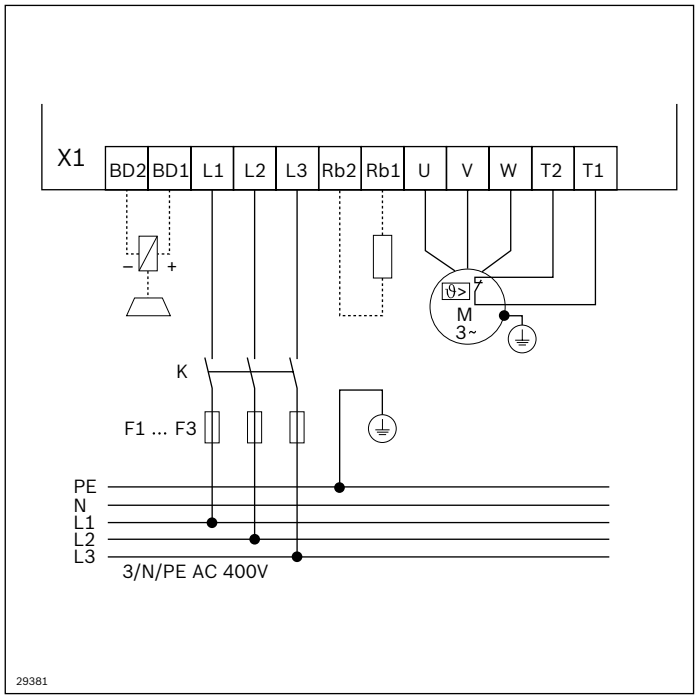
Drive range of the motors with frequency converters (FU)



Technical information:
At rotating field frequencies of ≥ 15 Hz, the motor can be operated under normal operating conditions without an external fan. The motor's thermal conditions should be considered at rotating field frequencies of ≤ 20 Hz.
With rotating field frequencies of > 50 Hz, higher speeds can also be achieved with corresponding performance losses. In the 20 ... 50 Hz range, the full torque is available.

Base speed of motor (m/min) **at 50 Hz**	**Min**[1] (m/min)	**Max**[2] (m/min)	**Max** (m/min) **at max. 80% torque**
5[3]	2	6	8
10[3]	4	12	16
13	5	15	21
16	6	19	26
21	7	25	34
27	9	32	43
33	11	39	52
40	13	48	–
50	16	60	–

[1] Min corresponds to approx. 16 Hz supply frequency
[2] Max corresponds to approx. 60 Hz supply frequency
[3] At 460 V/60 Hz max (m/min) 20% higher



——— Minimum wiring required for operation
----*)---- Additional wiring to change direction of rotation

Frequency converter (FU) accessories

In order to operate a drive with a frequency converter (FU), the user needs to work out the minimum wiring for the internal and external voltage supply (see terminal assignment plan left).

Ordering parameters for SEW motors

The following ordering information is required if using gear motors from SEW-Eurodrive GmbH & Co, Bruchsal:

- Motor type
- Ratio
- Installation position
- Position of drive output
- Position of terminal box
- Cable entry (Fig. 4)
- Motor voltage/frequency*)
- Thermal class*)
- Motor protection class*)

*) www.seweurodrive.com

SEW motors motor data

							400 V/50 Hz							400 V/60 Hz
v_N	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type
(m/min)	(m/min)		(rpm)	(rpm)	(Nm)	(W)	SAF37...	(m/min)		(rpm)	(rpm)	(Nm)	(W)	SAF37...
2	2.07	122.94	1,320	11	91	180	DR63M4	2.07	144.4	1,620	11	92	180	DR63M4
4	4.14	55.93	1,300	22	81	250	DR63L4	4.14	71.44	1,600	22	84	250	DR63L4
6	6.03	43.68	1,380	32	81	370	DRS71S4	6.03	53.83	1,700	32	80	370	DRS71S4
9	9.04	28.76	1,380	48	75	370	DRS71S4	9.04	35.1	1,700	48	75	370	DRS71S4
12	11.49	22.5	1,380	61	73	550	DRS71M4	11.12	28.76	1,690	59	75	550	DRS71M4
15	14.32	18.34	1,380	76	52	550	DRS71M4	14.13	22.5	1,690	75	73	550	DRS71M4
18	19.41	13.39	1,380	103	49	550	DRS71M4	17.53	18.24	1,690	93	52	550	DRS71M4
2 to 7[2]	1.5-7.53	35.1	280-1,400	8.0-40	78	370	DRS71S4MM03	1.5-7.53	35.1	280-1,400	8.0-40	78	370	DRS71S4MM03
7 to 18[2]	3.95-19.79	13.39	280-1,400	21-105	49	550	DRS71M4MM05	3.95-19.79	13.39	280-1,400	21-105	49	550	DRS71M4MM05

Motor data SEW motors for HQ 5: b = 455

							400 V/50 Hz							400 V/60 Hz
v_N	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type
(m/min)	(m/min)		(rpm)	(rpm)	(Nm)	(W)	WAF10...	(m/min)		(rpm)	(rpm)	(Nm)	(W)	WAF10...
6	6.09	27.50	1,300	47	12.0	90	DT56M4	6.34	32.50	1,600	49	12.0	90	DT56M4
9	8.59	19.50	1,300	67	9.4	90	DT56M4	8.41	24.50	1,600	65	9.4	90	DT56M4
12	11.69	14.33	1,300	91	7.6	90	DT56M4	12.49	16.50	1,600	97	7.6	90	DT56M4

Motor data SEW motors for HQ 5: b = 650/845

							400 V/50 Hz							400 V/60 Hz
v_N	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type	v[1]	i	n1[3]	n2[4]	M_N	P[5]	Type
(m/min)	(m/min)		(rpm)	(rpm)	(Nm)	(W)	WAF20...	(m/min)		(rpm)	(rpm)	(Nm)	(W)	WAF20...
6	6.18	27.50	1,320	48	24.0	180	DR63M4	6.42	32.50	1,620	50	24.0	180	DR63M4
9	8.72	19.50	1,320	68	19.0	180	DR63M4	8.52	24.50	1,620	66	19.0	180	DR63M4
12	11.86	14.33	1,320	92	15.0	180	DR63M4	12.49	16.50	1,600	97	15.0	250	DR63L4

1) Transport speeds at other voltages/frequencies provided on request.
2) Electronically controlled by a frequency converter (FU).
3) n1 = motor speed
4) n2 = gear output speed
5) Motor output

AS 5/XH, AS 5/H technical data:

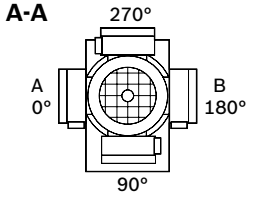
Max. torque limit:	45 Nm (toothed belt) limit
Toothed belt drive gear ratio:	1:1
Flange ø:	120 mm
Drive shaft:	SW27 on shaft ø 20
Conveyor roller ø:	60 mm

Motor mounting orientation, terminal box, cable entry

Motor mounting	Installation position	Drive output	Terminal box
R	M2 (M1)	B	0°
L	M2 (M1)	A	180°

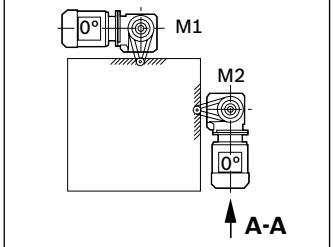
Position of terminal box

Fig. 1



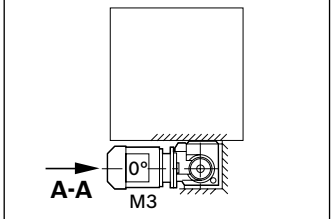
Installation position horizontal top/vertical

Fig. 2



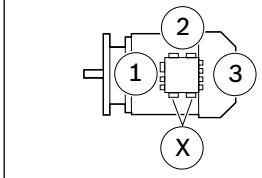
Installation position horizontal

Fig. 3



Cable entry point

Fig. 4



Conversion table for metric/imperial dimensions

Measurement	Multiply	by	to get:
Linear	millimeters (mm)	0.03937	inches
	inches	25.4	millimeters (mm)
	kilometers (km)	0.6214	miles
	miles	1.6093	kilometers (km)
Area	millimeters^2 (mm^2)	0.00155	inches^2
	inches^2	645.16	millimeters^2 (mm^2)
Volume	centimeters^3 (cm^3)	0.06102	inches^2
	inches^3	16.387	centimeters^3 (cm^3)
	1 cm^3 = 1 mililiter (ml)		
	1000 ml = 1 Liter		
Acceleration	meter/second^2 (m/s^2)	39.37	inch/second^2
	inch/second^2	0.0254	meter/second^2 (m/s^2)
Velocity	meter/second	3.281	feet/second
	feet/second	0.3048	meter/second
Mass	kilogram (kg)	2.2046	pounds
	pounds	0.4536	kilogram (kg)
Force	kilograms-f (kgf)	9.807	Newtons (N)
	Newtons (N)	0.10194	kilograms-f (kgf)
	pounds-f	4.448	Newtons (N)
Pressure	Newtons	0.2248	pounds-f
	bar	14.5	PSI
	PSI	0.069	bar
Torque	Newton meters (Nm)	8.851	pound inches
	pound inches	0.11298	Newton meters (Nm)
Moment of Inertia	centimeters^4 (cm^4)	0.02403	inches^4
	inches^4	41.623	centimeters^4 (cm^4)
Power	kilowatts (Kw)	1.34	horsepower (HP)
	horsepower (HP)	0.746	kilowatts (Kw)
Energy	Joules (J)	0.7376	foot/pounds (ft/lbs)
	foot/pounds (ft/lbs)	1.3558	Joules (J)

Metric Tap/Drill Specifications

Tap	Drill Size
M4 × 0.7	3.3 mm
M5 × 0.8	4.2 mm
M6 × 1	5.0 mm
M8 × 1.25	6.8 mm
M12 × 1.75	10.2 mm
M16 × 2	14.0 mm

Temperature

Degrees Celsius

$$\frac{5 \times (\text{degrees Fahrenheit} - 32)}{9}$$

Degrees Fahrenheit

$$\frac{9 \times (\text{degrees Celsius}) + 32}{5}$$