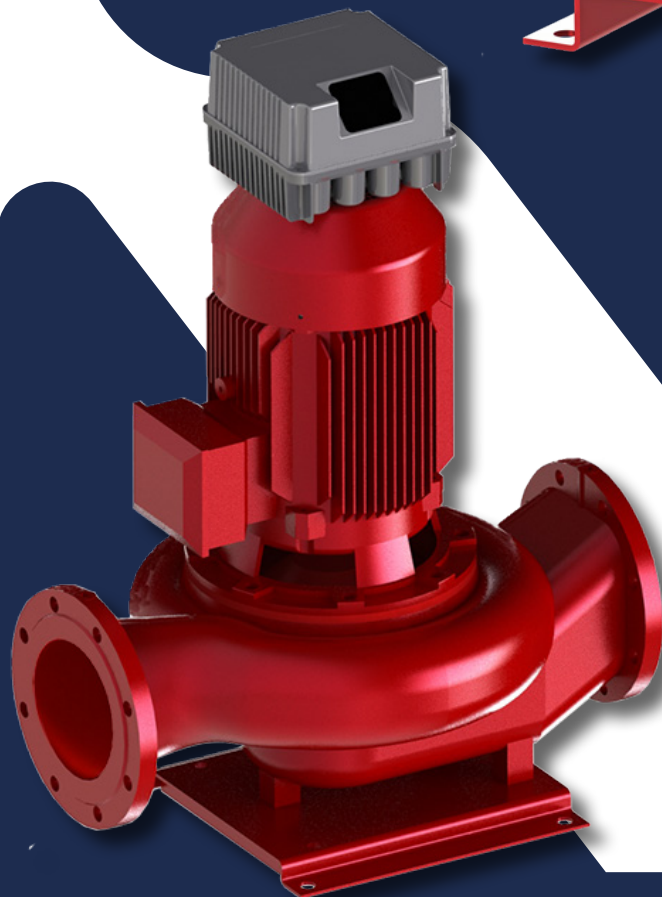
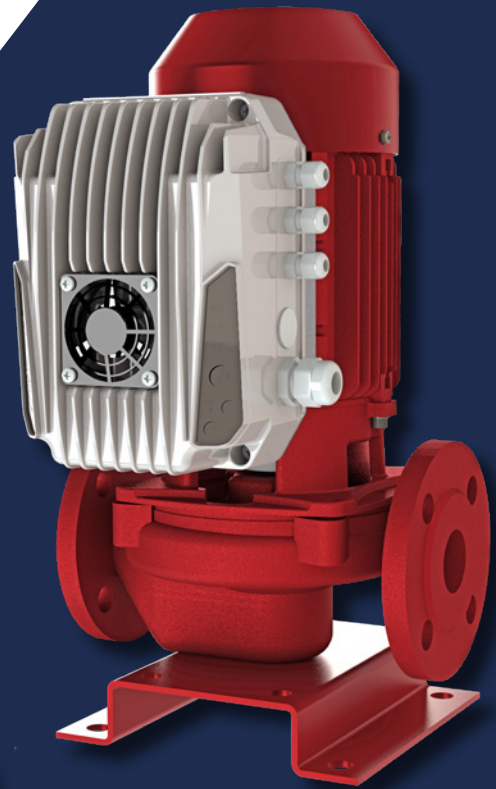


PUMP CATALOGUE



SC-, MD- AND NC-PUMPS
WITH INTEGRATED FREQUENCY CONVERTER

Kolmeks is a Finnish manufacturing company and part of the family-owned Brandt Group Oy Ltd. The group has factories in Finland, Estonia, China and India, providing customers with expertise in two business areas: pumps and components (production and supply chain solutions). Kolmeks Pumps specializes in state-of-the-art pumps, HVAC products and dedicated maintenance services.

The pump specialist

We have been engineering pumps for over 75 years and striving to develop a portfolio of state-of-the-art pumping equipment. Pump technology and application know-how are our core competencies. We provide our customers with high-quality pumping and HVAC solutions as well as versatile maintenance services.

The main industries we work with

include building services, industrial, marine and mobility operators. Kolmeks pumps are typically used in the pulp, paper and chemical industries as well as in other process industries.

Now and in the future, the human infrastructure depends on pumps that improve the quality of lives through sustainable means.

Planet, people and continuity are the cornerstones of our sustainability strategy.





The pumps and their motors are designed and manufactured with the highest craftsmanship and they meet the demands of the European EcoDesign directive. Kolmeks was also among the first Finnish companies to receive the ISO 9001 Quality certificate and the ISO 14001 Environmental certificate.

We strive to be a solutions provider helping our customers to succeed by offering the most efficient, reliable and sustainable products and services.

Kolmeks pumps are available in four different materials; grey cast iron, nodular cast iron, bronze and stainless steel casting. The pumps are also available with several different shaft sealing solutions – which makes them suitable for numerous pumping applications.

Global reach, local presence

We have been operating in the Finnish pump market since 1945. Today, a large part of the pumps we manufacture are delivered, to all major European countries and China. Increasingly, Kolmeks products are also exported to several countries in the Middle East, Asia and Africa.

Turenki and Chuzhou are key sites for Kolmeks's own pumps manufacturing and motor assembly.

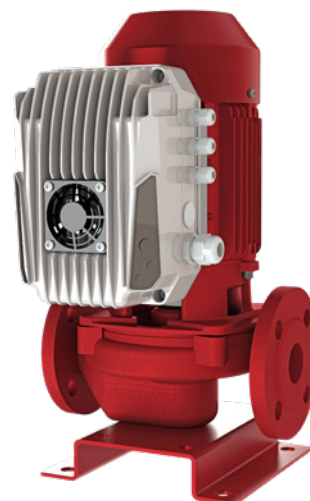
Ask us more about our products and services! We will be more than happy to provide you with solutions.

www.kolmeks.com



Pump ranges

Kolmeks has three ranges of pumps with integrated frequency control; the SC-, MD- and NC -ranges. The smallest pump with integrated frequency control is 0,08 kW, the largest 45 kW. In addition, all of the pumps are suited for control by external frequency control.



DOMESTIC HOT WATER PUMPS AND SEAWATER PUMPS, INLINE

TECHNICAL INFORMATION

p. 7 – 15

INLINE PUMPS WITH INTEGRATED SC AND MD FREQUENCY CONVERTER
(temperature range: -15 ... +95°C)

CIRCULATING PUMPS TO THE HEATING AND COOLING SYSTEMS, INLINE

TECHNICAL INFORMATION

p. 17– 38

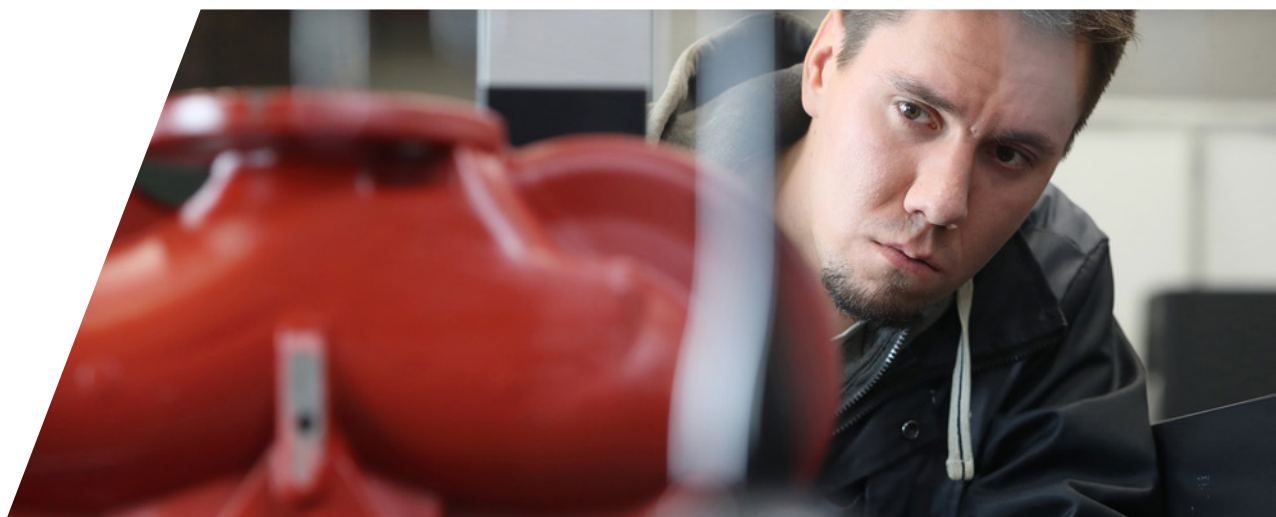
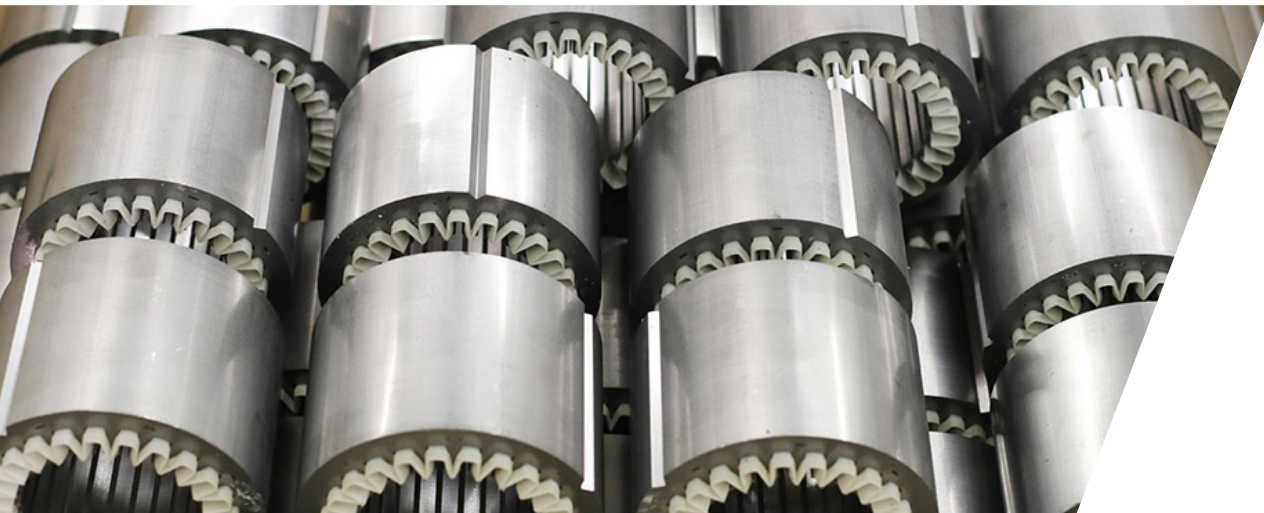
INLINE PUMPS WITH INTEGRATED SC AND MD FREQUENCY CONVERTER
(temperature range: -15 ... +95°C)

CIRCULATING PUMPS TO THE POWER PLANTS AND PRIMARY SIDE OF DISTRICT HEATING SYSTEMS, INLINE

TECHNICAL INFORMATION

p. 39– 44

INLINE PUMPS WITH INTEGRATED NC FREQUENCY CONVERTER
(temperature range: -15 ... +180°C)



TECHNICAL INFORMATION

DOMESTIC HOT WATER PUMPS AND SEAWATER PUMPS, INLINE

INLINE PUMPS WITH INTEGRATED SC FREQUENCY
CONVERTER, 1x230V

INLINE PUMPS WITH INTEGRATED MD FREQUENCY
CONVERTER, 1x230V; 3x400V



General technical data

AEP, LP and ALP pumps are bronze domestic hot water pumps equipped with an integrated frequency converter according to the SCA (1x230V) – and MDA (1x230V , 3x400V) –version.

Other versions are also available if needed, see Frequency converter pumps SC series in this product catalogue.

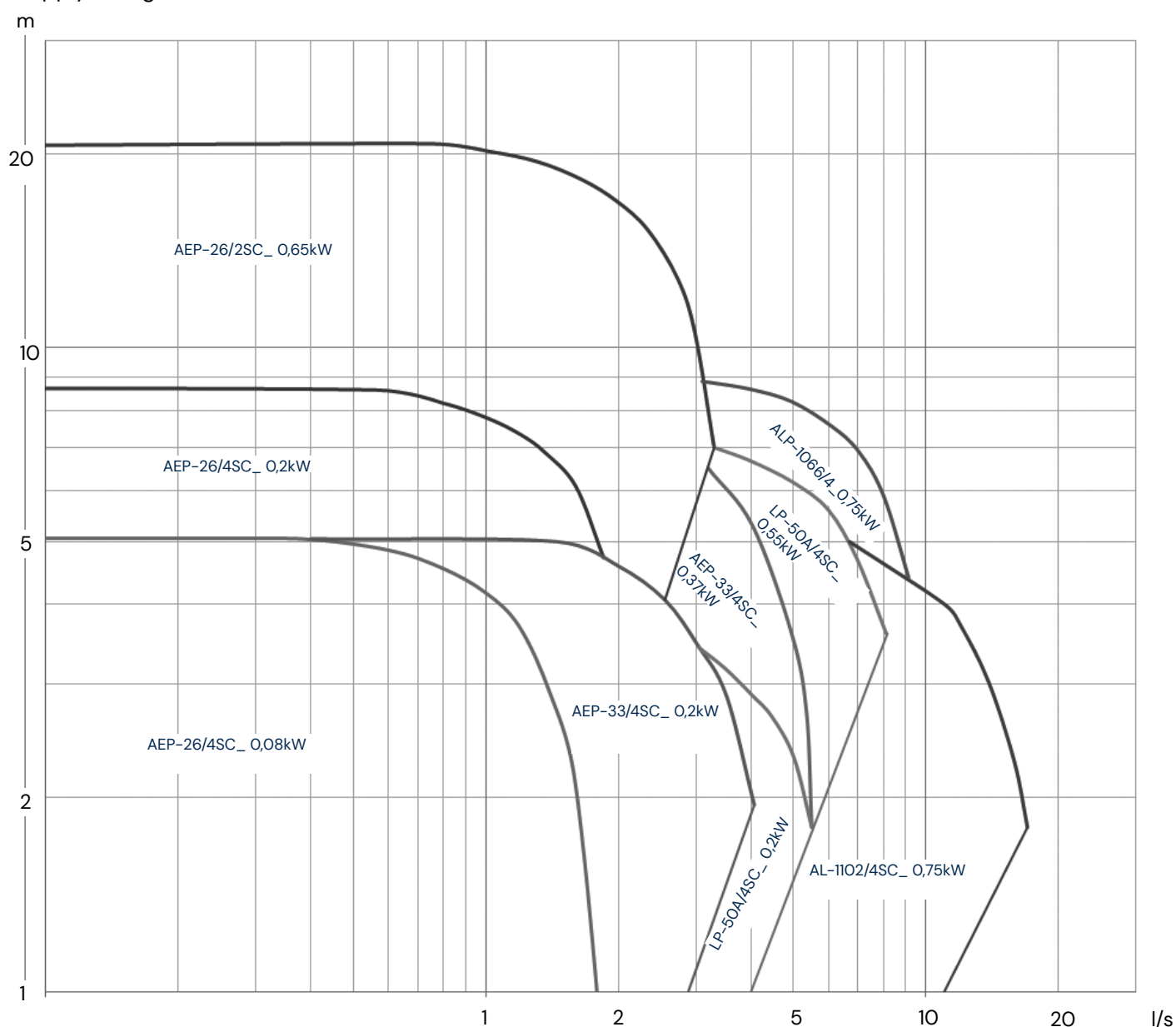
- AEP pumps are equipped with threads G1 – G1 1/4
- LP and ALP pumps are equipped flanges DN50 ... DN100

Applications

These bronze pumps are mainly used for the circulation of domestic hot water and seawater. They can also be used in standard circulation systems, as pressure boosters and as transfer pumps for various clean oxygen-rich liquids.

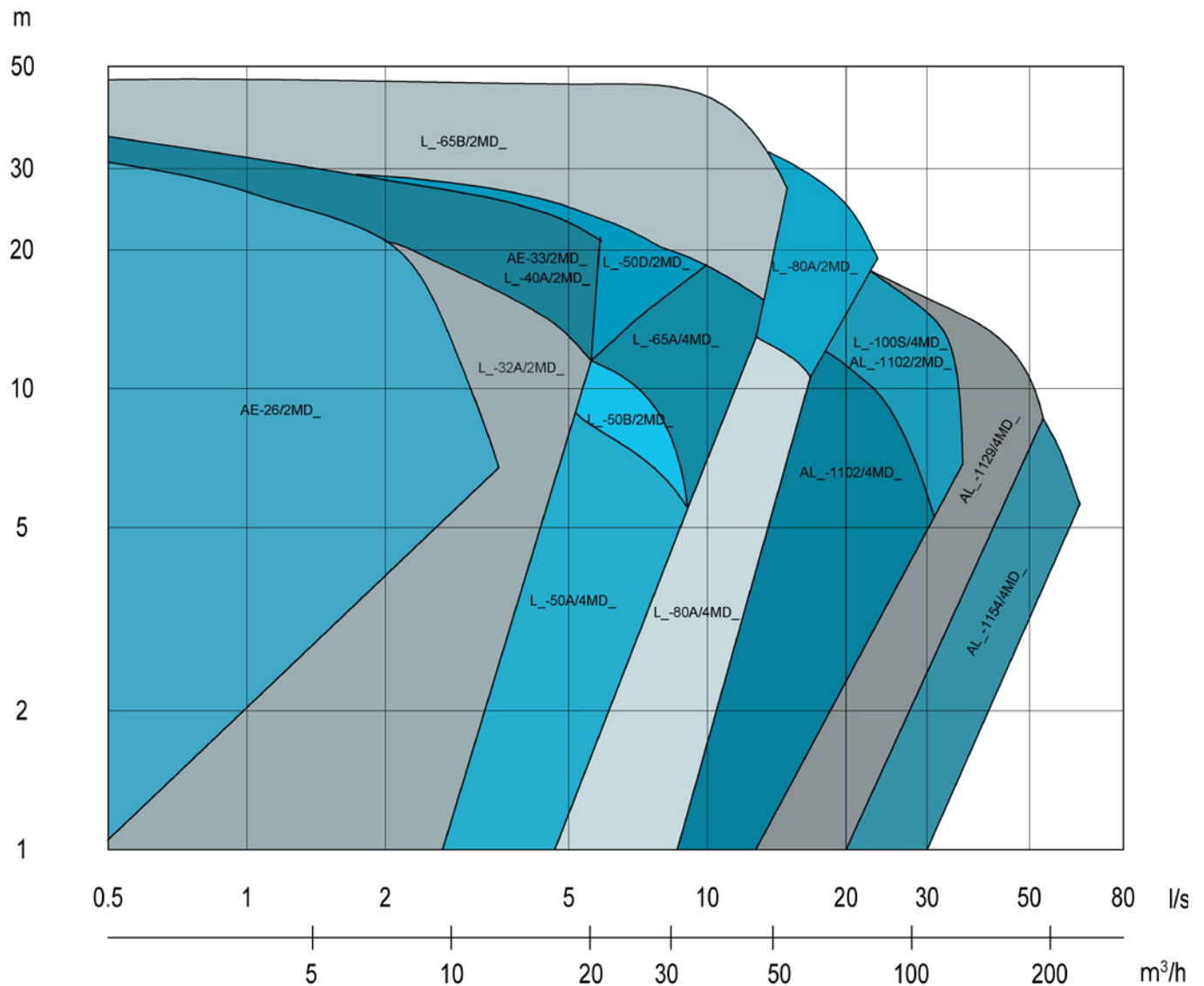
Quick selection chart SC-pumps

Supply voltage 1x230V



Quick selection chart MD-pumps

Supply voltage 1x230V; 3x400V.



Structure

Pump

SC_- and MD domestic hot water pumps are monoblock centrifugal pumps equipped with a dry motor, which fulfill the requirements of EcoDesign –directive. The impeller is installed directly onto the shaft of the electric motor (no separate couplings). A frequency converter is integrated into the pump motor.

Electric motor

The electric motor is a three-phase Kolmeks asynchronous motor designed specifically for pump use and frequency converter operation, which guarantees high starting torque and low energy consumption and fulfills the requirements of EcoDesign –directive. The electric motor is highly efficient and has low noise levels.

Supply voltage:	SC: 1 x 230 V, 50 Hz MD: 1 x 230 V , 3 x 400V, 50Hz
Enclosure class:	IP 54
Insulating class:	F
Duty type:	Continuous duty (S1)
Ambient temperature:	0 ... +40°C

Connection types

Threaded:

The SC_ and MD_ pumps threads are dimensioned according to Standard ISO 228/1.

Flanged:

The flanges of an SC_ and MD_ pumps fit counter-flanges dimensioned according to ISO 7005.

Seals:

The standard shaft seal of an SC_ and MD_-series pumps is a single mechanical seal. The pump housing seal

AEP-, LP- and ALP- domestic hot water pumps with SCA and MDA frequency converters

Standard materials

Connection G or DN	Bronze CuSn10Zn2, PN10	Shaft seal, PN10 Ø [mm], materials	Housing size [mm]	O-ring Material	Motor [kW]
G1	AEP-26/4 SCA	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AEP-26/2 SCA	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
G1 1/4	AEP-33/4 SCA	12, carbon/SiC Viton	145 X 2,5	NBR	0,2 and 0,37
DN50	LP-50A/4 SCA	12, carbon/SiC EPDM	150 X 3	NBR	0,2 and 0,55
DN65	ALP-1066/4 SCA	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN100	ALP-1102/4 SCA	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,75

Connection G or DN	Bronze CuSn10Zn2, PN10	Shaft seal, PN10 Ø [mm], materials	Housing size [mm]	O-ring Material	Motor [kW]
G1	AEP-26/2 MDA	12, carbon/SiC Viton	123 X 2,5	NBR	1,1
G1 1/4	AEP-33/2 MDA	12, carbon/SiC Viton	145 X 2,5	NBR	1,1 and 1,5
DN50	LP-50A/4 MDA	12, carbon/SiC EPDM	150 X 3	NBR	0,9
	LP-50B/2 MDA	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	LP-50D/2 MDA	18, carbon/SiC EPDM	150 X 3	NBR	1,5 and 3
DN65	ALP-1066/4 MDA	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,9; 1,5 and 2,2
	ALP-1065/2 MDA	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	3, 4 and 7,5
DN100	ALP-1102/4 MDA	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,9; 1,5 and 3
	ALP-1102/2 MDA	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	4 and 7,5
	LP-100S/4 MDA	32, carbon/ SiC EPDM	315 X 6,3	EPDM	4, 5,5 and 7,5
DN125	ALP-1128/4 MDA	32, carbon/ SiC EPDM	309/295X1	gasket	5,5 and 7,5
DN150	ALP-1153/4 MDA	32, carbon/ SiC EPDM	309/295X1	gasket	7,5

Kolmeks recommendation for pumps in district heating circulation systems

SCA- and MDA-version bronze domestic hot water pump equipped with an integrated frequency converter.

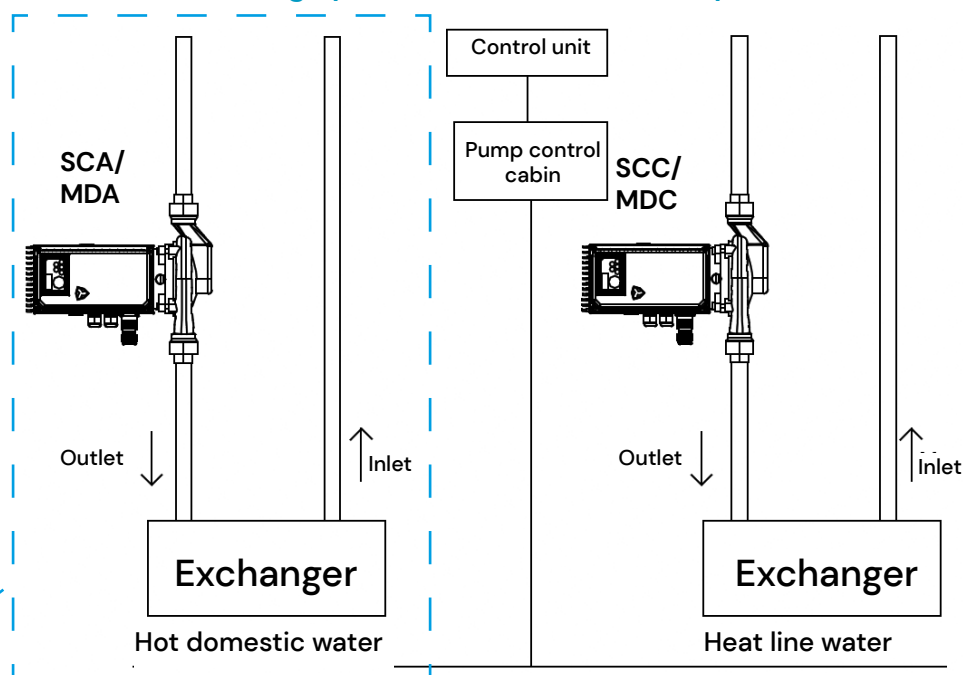
SC –series supply voltage
1 x 230 V

MD –series supply voltage
1x230V; 3 x 400 V

Advantages of SC- and MD –pump

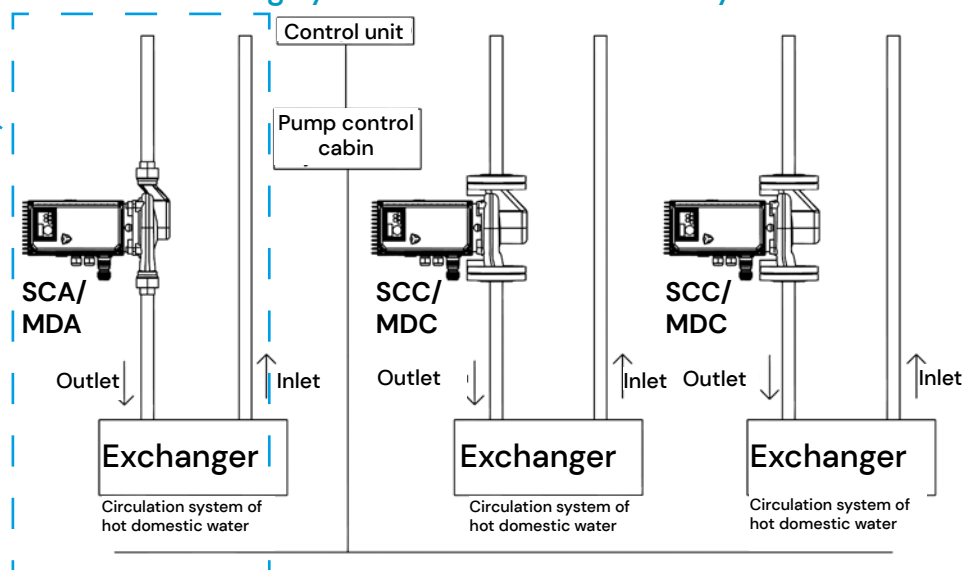
- Alarms to BMS
- Duty point can be adjusted in one step
- Automatically adapts to system heat/cooling requirements (radiator and air heating circulation)
- Energy savings
- Reliable operation
- Reduced wear in pipework and system valves leading to prolonged life
- Smoother system operation
- Replacement motor unit service

District heating system with two secondary circuits



Domestic hot water

District heating system with three secondary circuits



Rating plate information

Rating plate

Accessories:

T = External mechanical seal for aggressive liquids
H = Flushing
KT = Double mechanical seal
Sn = Non-standard mechanical seal
Kn = Non-standard surface treatment

Special impeller material:

PM = Bronze
SS = Stainless steel AISI316

Pump type	Pump L65A4SC75V-00003 SCC(1/4) O152106	Motor code marking
Serial number, Pressure class	No 225622.100 2021 PN 10 Ø 164 / mm	Impeller size
Duty point, Max liquid temperature	5,3 l/s 5,5 m 90 °C P1 kW	Electrical power at duty point (if required)
Motor type	Motor KPSC-80-2 F19 1~ 50 Hz S1	Supply voltage, phase number
Nominal voltage and current	230 V 6,0 Amax P2N 0,75 kW 5-25 r/s	Nominal shaft power and rotation speed
Insulating and enclosure class	Isol F IP54 MEI ≥ 0,4 --	Minimum efficiency index (MEI)
Manufacturer, Country of origin	Kolmeks Finland D 6305-VVC3E N 6204-VVCM CE	Bearing types, CE marking

1 2 3 4 5
AL - 110 2 / 4 MD C
L P - 50 A / 4 SC A

1) Pump series:

AE-, L-, AL-

2) Housing, sealing flange and impeller material:

no letter = Grey cast iron EN-GJL-200

H = Nodular cast iron EN-GJS-400

P = Bronze CuSn10Zn2

S = Stainless steel AISI 316

3) Connection sizes:

26 = 1"

33 = 1 1/4"

32 = DN 32

40 = DN 40

50 = DN 50

65 = DN 65

106 = DN 65

80 = DN 80

110 = DN 100

4) Electric motor pole number:

2 = rotation speed 50 r/s (50 Hz)

4 = rotation speed 25 r/s (50 Hz)

rotation speed 30 r/s (60 Hz)

rotation speed 32.5 r/s (65 Hz)

5) SC = SC frequency converter integrated in pump.

MD = MD frequency converter integrated in pump:

Pump adjustment method SCA, SCB, SCC, SCD, SCF, SCG, SCM / MDA, MDB, MDC, MDD, MDF, MDG, MDM

Installation

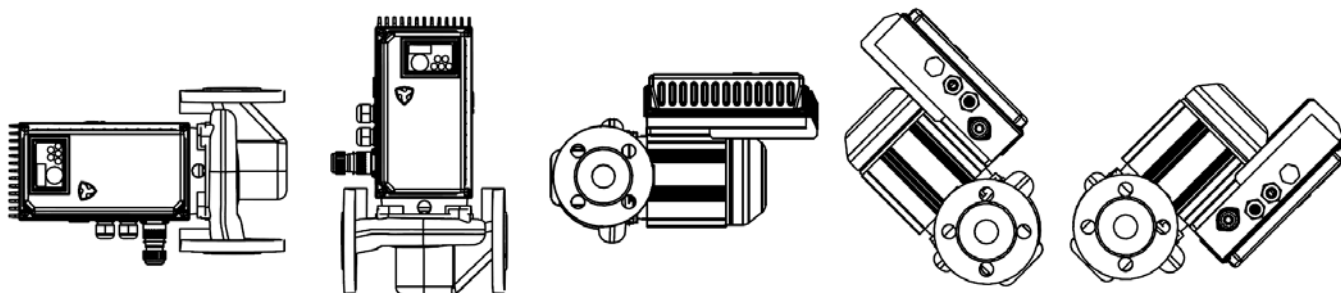
The pump can be installed directly in the pipework without additional support. The pumps with flanges include the base plate.

The position of the motor unit and therefore the location of the frequency converter box can be changed by detaching the motor unit from the pump housing and rotating it to the required position, with certain limitations.

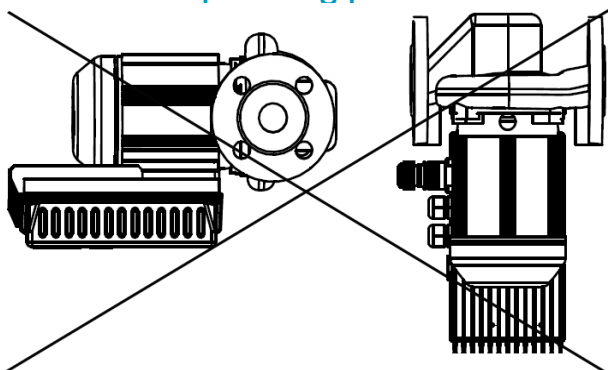
Ensure the following when installing the pump

- Enough room for control, service and inspections
- The installation position should be chosen such that the display is readable; a separate control panel can also be used if required.
- Possibility to use lifting and transfer devices if needed
- Shut-off valves on both sides of the pump
- Pump must be installed in such a position that the integrated frequency converter is not in the immediate vicinity of a hot pipes and is fully accessible.

Operating positions

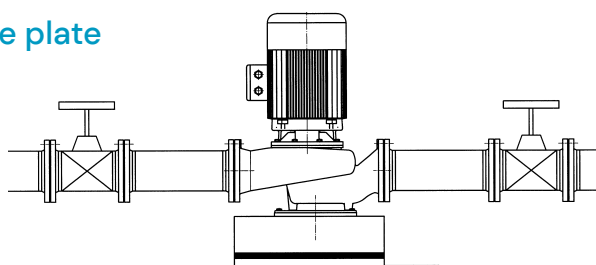


Prohibited operating positions



Recommended general limits without the base plate

Size	Power
DN 15 ... 50	max. 2,2 kW
DN 65	4 kW
DN 80	4 kW
DN 100	7,5 kW
DN 125	7,5 kW



Large pumps are fastened by their base plate onto a freely moving concrete plinth, which is to be separated from the floor by a 20-mm thick rubber or cork mat. The weight of the concrete base must be about 1.5 times the weight of the pump.

SCA / MDA pump: Direct speed reference using a potentiometer

Applications

For systems with no continuous automatic adjustment requirement and a constant duty point, such as domestic hot water circulation systems, for example.

Accessories

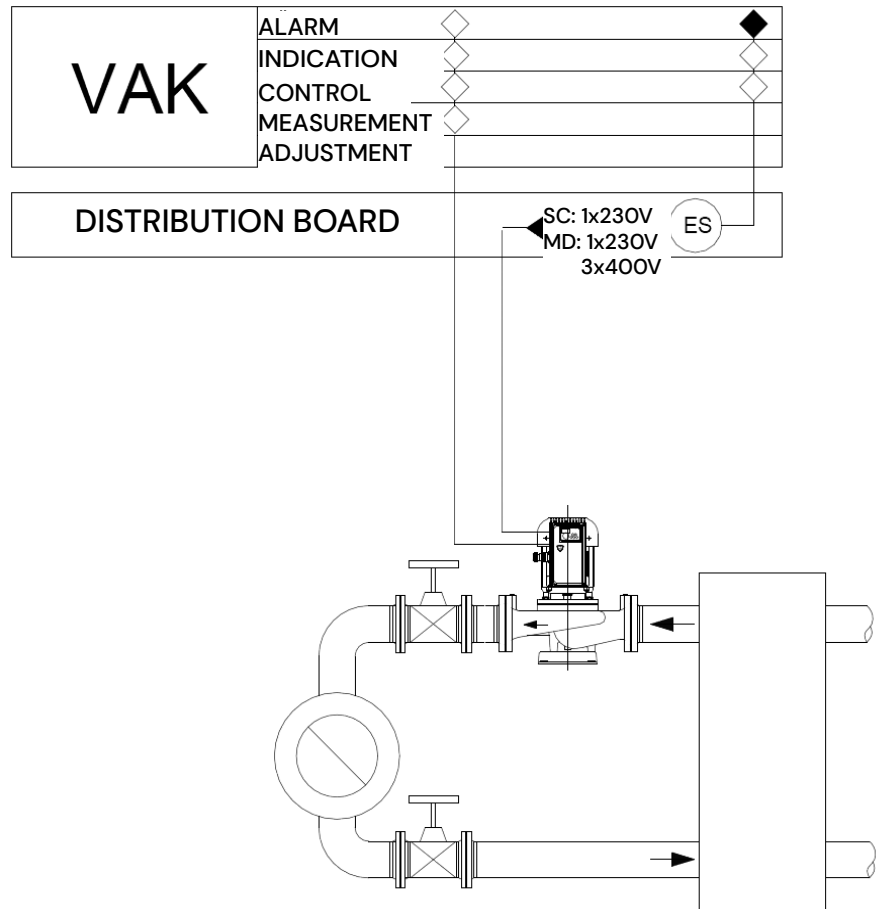
Pump and frequency converter.

Operating principle

The rotation speed of the pump is set in one step during commissioning using the buttons on the frequency converter. In MD –pump it is recommended to use Mobile application via Bluetooth.

Pump curve

The pump QH curve equals the QH curve of a standard speed pump.



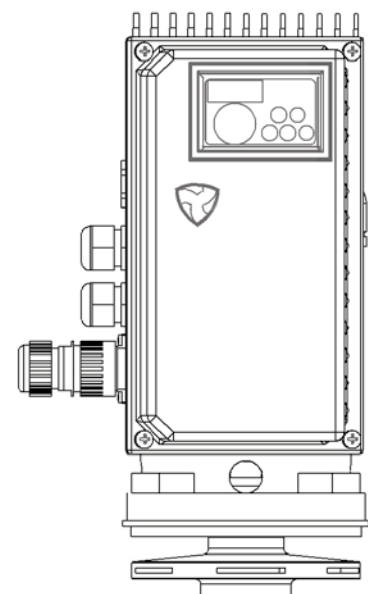
Drive unit

Exchange unit (SCA, MDA)

The pump motor unit without the transmitter includes an electric motor, a frequency converter, a sealing flange, an impeller, and seals. When replacing the exchange unit, no procedures need to be carried out on the piping or electricity, because there is no need to detach the pump housing and the power supply is connected using a quick connection plug.

SCA –pumps are equipped with quick connecting plug in mains supply.

In MD –pumps the mains supply is fixed.



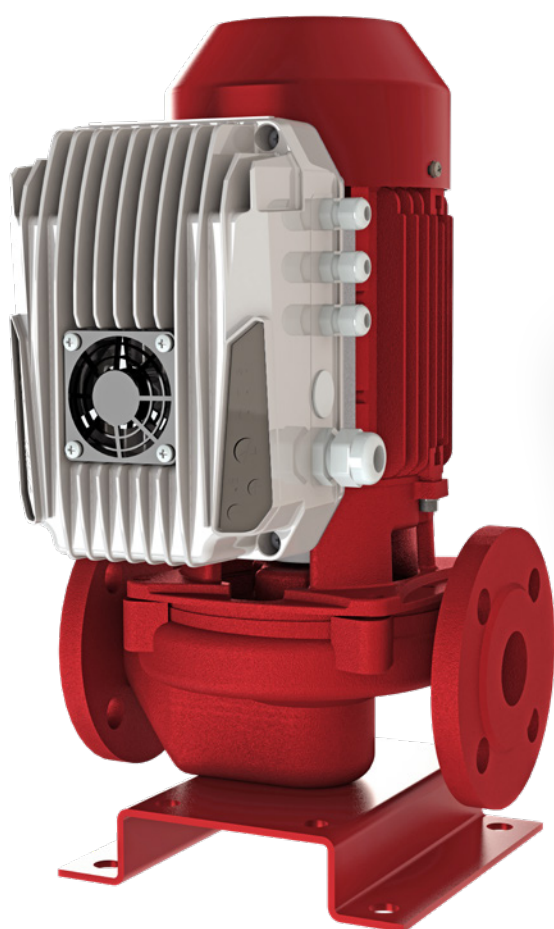
This image shows a full page of blank, lined paper. It features approximately 30 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.

TECHNICAL INFORMATION

CIRCULATING PUMPS TO THE HEATING AND COOLING SYSTEMS, INLINE

INLINE PUMPS WITH INTEGRATED SC FREQUENCY
CONVERTER, 1X230V

INLINE PUMPS WITH INTEGRATED MD FREQUENCY
CONVERTER, 1x230V, 3X400V



General technical data

SC- and MD-series of Kolmeks circulation pumps and variable speed controlled centrifugal pumps with integrated frequency converter.

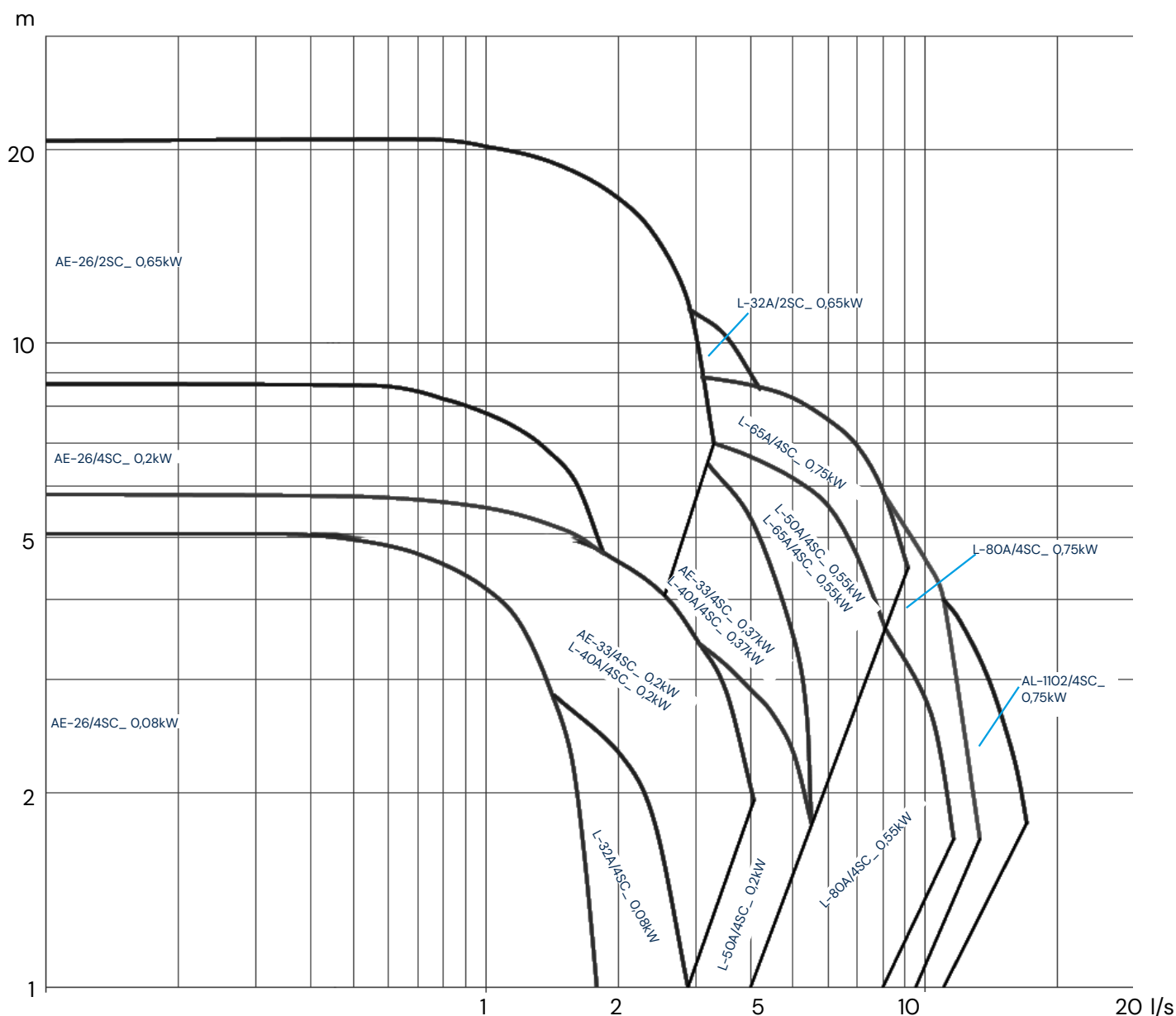
Applications

Cast iron SC- and MD series pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.

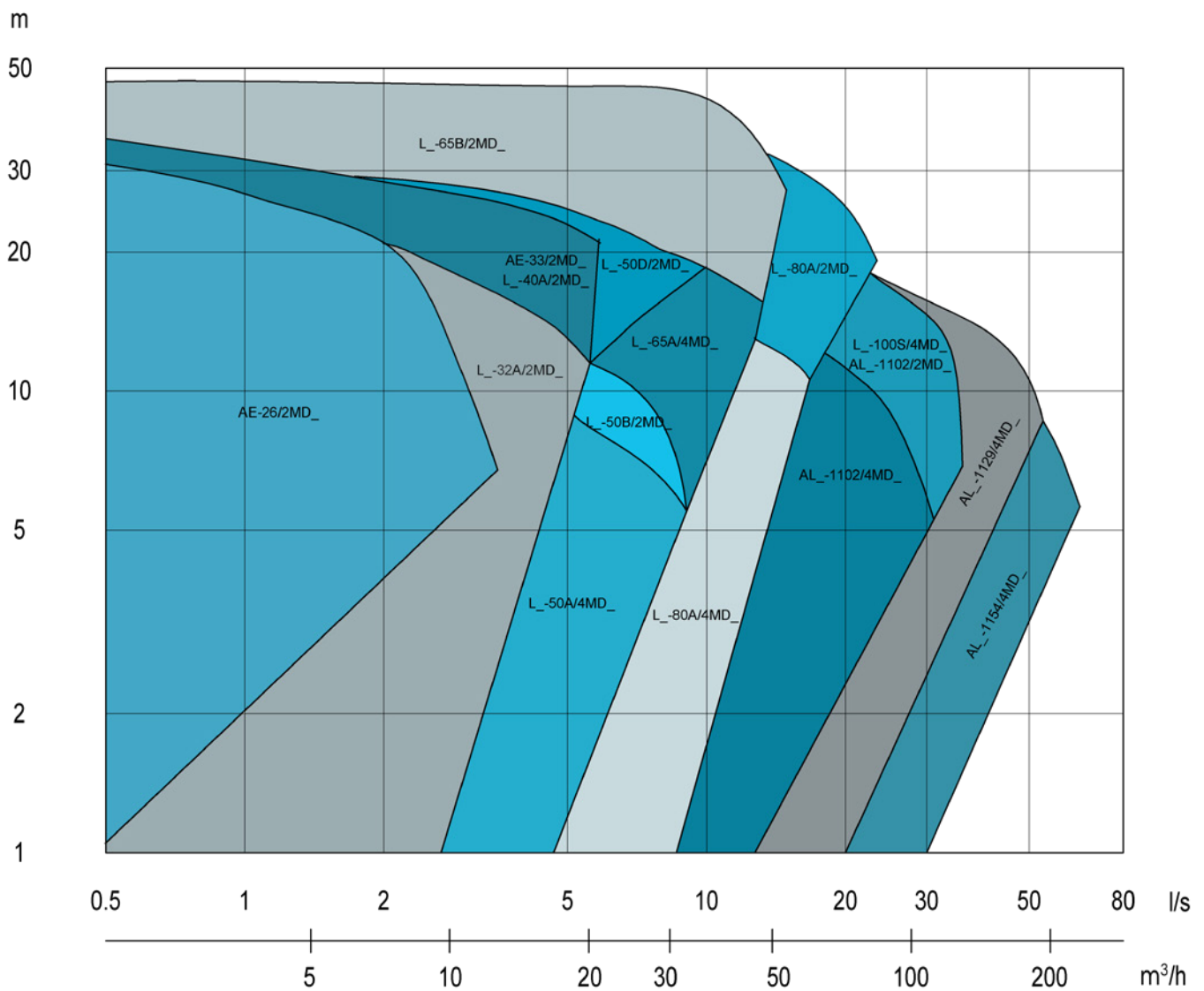
- Bronze SC and MD pumps can be used as domestic hot water, circulation, pressure boosting and transfer pumps for clean, oxygen-rich and some slightly aggressive liquids.
- Stainless steel AISI316 SC and MD pumps can be used as circulation, pressure boosting and transfer pumps for clean and aggressive liquids.

The most common applications of the SC and MD pump series are heating, ventilation, cooling and heat recovery systems, heat exchangers, pressure boosting, district heating plants, ice rinks, swimming pools, spas and industrial processes.

Quick selection chart SC-pumps



Quick selection chart MD-pumps



Structure

Pump

SC- and MD-series pumps are monoblock-structured centrifugal pumps with a dry asynchronous motor, which fulfill the requirements of EcoDesign –directive. A frequency converter is integrated into the motor. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Electric motor

The electric motor of SC- and MD-pump is a three-phase Kolmeks asynchronous motor designed specifically for pump use and frequency converter operation, which guarantees high starting torque and low energy consumption. The electric motor is highly efficient and has low noise levels and fulfills the requirements of EcoDesign –directive.

Supply voltage:	SC: 1 x 230 V, 50 Hz MD: 1 x 230V, 50 Hz 3 x 400 V, 50 Hz
Enclosure class:	IP 54
Insulation class:	F
Duty type:	Continuous duty (S1)
Ambient temperature:	0°C ... +40°C

Connections

Flanged:

The flanges of SC- and MD-pump fit counter-flanges dimensioned according to ISO 7005.

Threaded:

The SC and MD-pump threads are dimensioned according to Standard ISO 228/1.

Seals

The standard shaft seal of an SC- and MD-series pump is a single mechanical seal. The pump housing seal is O-ring or flat gasket. Other seal options are available by request.

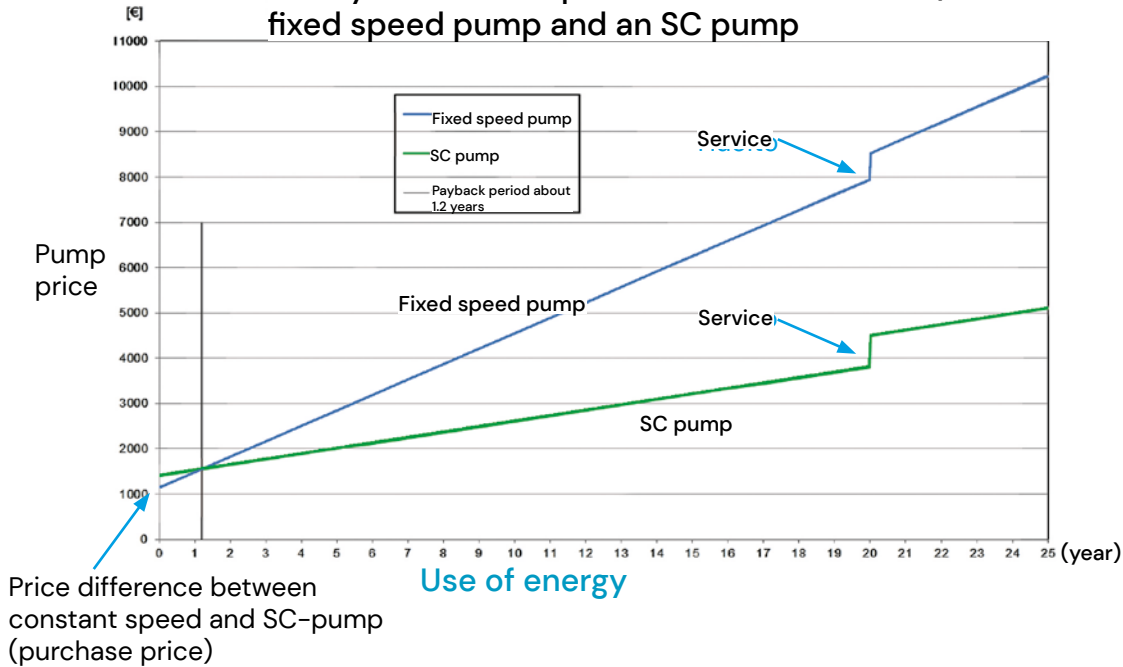
Advantages of selecting an SC or MD pump

- The pump is adjusted manually / automatically adjusts its duty to match the requirements of the system
- The duty point, and therefore the electric power consumption, is determined by actual flow requirements, resulting in reduced running and life cycle costs.
- Depending on pump size, the payback period compared to a fixed speed pump is 0.5–2.5 years (see example).

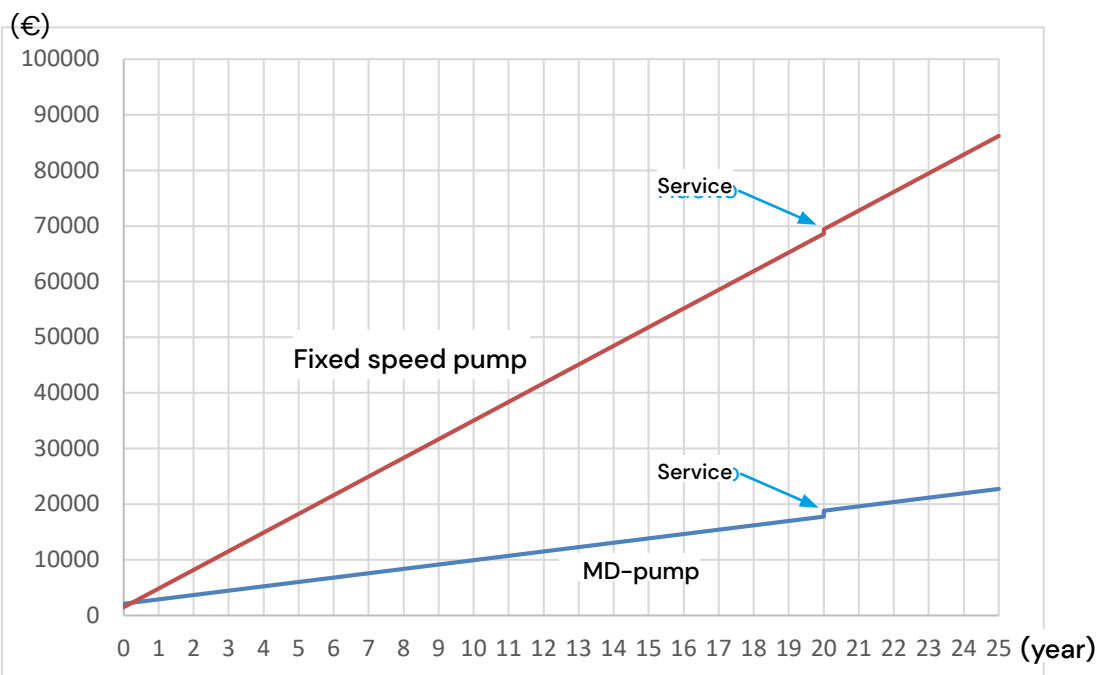
Cost comparison, $Q=6\text{l/s}$, $H=35\text{kPa}$
L-65A/4 0.55kW fixed speed pump
L-65A/4 SCG 0.55kW with integrated frequency converter

Accumulative cost

Life cycle cost comparison between an L-65/A 0.55 kW fixed speed pump and an SC pump



Cost comparison, $Q=20\text{l/s}$, $H=113\text{kPa}$
AL-1102/2 Ø128 4kW fixed speed pump
AL-1102/4 MDC Ø181 3kW 60Hz with integrated frequency converter



Kolmeks recommendation for pumps in district heating circulation systems

As the payback period for installing a Kolmeks SC variable speed pump is short, Kolmeks recommends the use of variable speed pumps in new systems and the replacement of fixed speed pumps with variable speed pumps in existing systems.

Supply voltage

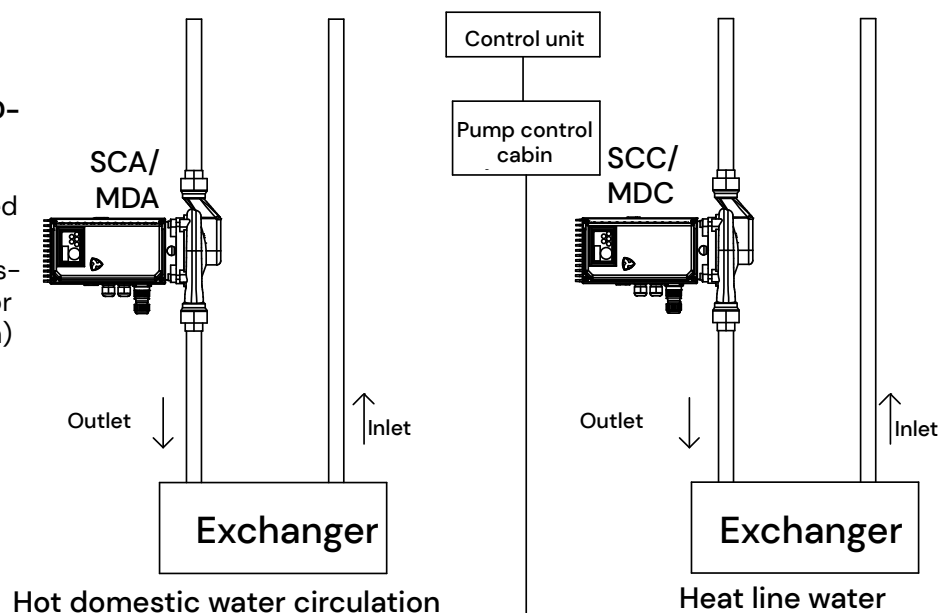
SC: 1 x 230 V

MD: 3 x 400 V

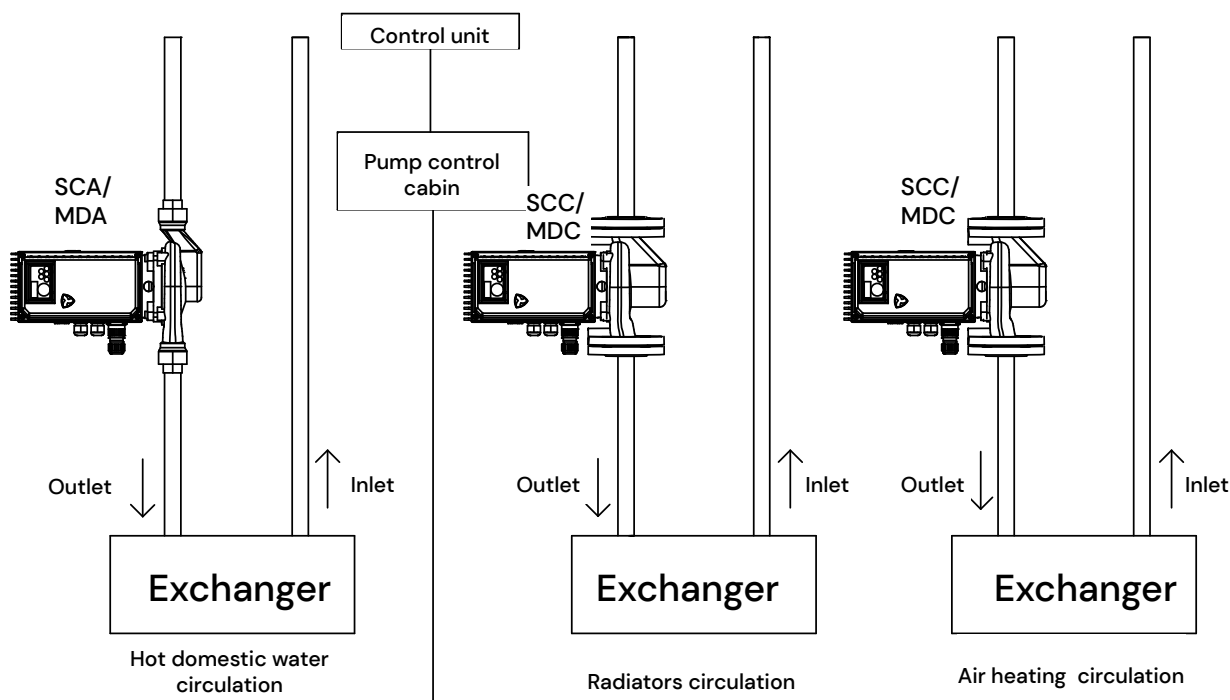
District heating system with two secondary circuits

Advantages of SC- and MD-pumps

- Alarms to BMS
- Duty point can be adjusted in one step
- Operates according to system requirements (radiator and air heating circulation)
- Energy savings
- Reliable operation



District heating system with three secondary circuits



Examples of Kolmeks recommendations for pumps in district heating circulation systems

Standard materials and fields of application for SC pumps

Connection size G or DN	Grey cast iron EN- GJL-200 PN10	Nodular cast iron EN- GJS-400 PN16	Bronze CuSn10Zn2 PN10	Stainless steel AISI 316 PN 16	Shaft seal PN10 Ø [mm] materials	O-ring size [mm]	O-ring material	Motor [kW]
G1	AE-26/4 SC_	-	AEP-26/4 SC_	-	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-26/2 SC_	-	AEP-26/2 SC_	-	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
G1 1/4	AE-33/4 SC_	-	AEP-33/4 SC_	-	12, carbon/SiC Viton	145 X 2,5	NBR	0,2 and 0,37
DN 32	L-32/4 SC_	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	0,08 and 0,2
	L-32/2 SC_	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	0,65
DN 40	L-40A/4 SC_	-	-	-	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2 and 0,37
DN 50	L-50A/4 SC_	-	LP-50A/4 SC_	-	12, carbon/SiC EPDM	150 X 3	NBR	0,2 and 0,55
DN 65	L-65A/4 SC_	LH-65A/4 SC_	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
	-	-	ALP-1066/4 SC_	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 80	L-80A/4 SC_	LH-80A/4 SC_	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 100	AL-1102/4 SC_	ALH-1102/4 SC_	ALP-1102/4 SC_	ALS-1102/4 SC_	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,75

Operating temperature -15...+95 °C

PN10 = Max. working pressure 10bar, grey cast iron and bronze

PN16 = Max. working pressure 16bar, nodular cast iron and stainless steel

Standard materials and fields of application for MD-pumps

Connection size G or DN	Grey cast iron EN-GJL-200, PN10	Nodular cast iron EN-GJS-400, PN16	Bronze CuSn10Zn2, PN10	Stainless steel AISI 316, PN 16	Shaft seal PN10 Ø [mm] materials	O-ring size [mm]	O-ring material	Motor [kW]
G1	AE-26/2 MD	-	AEP-26/2 MD	-	12, carbon/SiC Viton	123 X 2,5	NBR	1,1
G1 1/4	AE-33/2 MD	-	AEP-33/2 MD	-	12, carbon/SiC Viton	145 X 2,5	NBR	1,1 and 1,5
DN 32	L-32A/2 MD	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	1,1
DN 40	L-40A/2 MD	-	-	-	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1 and 1,5
DN 50	L-50A/4 MD	-	LP-50A/4 MD	-	12, carbon/SiC EPDM	150 X 3	NBR	0,9
	L-50B/2 MD	-	LP-50B/2 MD	-	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	L-50D/2 MD	LH-50D/2 MD	LP-50D/2 MD	-	18, carbon/SiC EPDM	150 X 3	NBR	1,5 and 3
DN 65	L-65A/4 MD	LH-65A/4 MD	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,9, 1,5 and 2,2
	-	-	ALP-1066/4 MD	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,9, 1,5 and 2,2
	L-65B/2 MD	LH-65B/2 MD	-	LS-65B/2 MD	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	3, 4 and 7,5
	-	-	ALP-1065/2 MD	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	3, 4 and 7,5
DN 80	L-80A/4 MD	LH-80A/4 MD	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,9; 1,5 and 3
	L-80A/2 MD	LH-80A/2 MD	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	3, 4 and 7,5
DN 100	AL-1102/4 MD	ALH-1102/4 MD	ALP-1102/4 MD	ALS-1102/4 MD	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,9, 1,5 and 3
	AL-1102/2 MD	ALH-1102/2 MD	ALP-1102/2 MD	ALS-1102/2 MD	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4 and 7,5
	L-100S/4 MD	LH-100S/4 MD	-	-	32, carbon/SiC EPDM	315 x 6,3	EPDM	4, 5,5 and 7,5
DN 125	-	-	ALP-1128/4 MD	-	32, carbon/SiC EPDM	309/295X1	gasket	5,5 and 7,5
	AL-1129/4 MD	ALH-1129/4 MD	-	ALS-1129/4 MD	32, carbon/SiC EPDM	309/295X1	gasket	5,5 and 7,5
DN 150	-	-	ALP-1153/4 MD	-	32, carbon/SiC EPDM	309/295X1	gasket	7,5
	AL-1154/4 MD	ALH-1154/4 MD	-	ALS-1154/4 MD	32, carbon/SiC EPDM	309/295X1	gasket	7,5

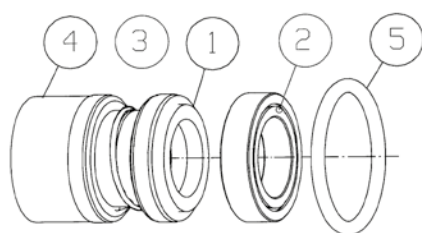
Operating temperature -15...+95 °C

PN10 = Max. working pressure 10bar, grey cast iron and bronze

PN16 = Max. working pressure 16bar, nodular cast iron and stainless steel

Shaft seal

The standard shaft seal of an MD-series pump is a single mechanical seal. The pump housing seal is O-ring or a gasket. Other seal options are available by request.



Part of single mechanical shaft seal

- 1 Rotating ring
- 2 Stationary ring
- 3 Body/bellows
- 4 Spring
- 5 O-ring

Rating plate information

Rating plate

Additional accessories:

T = Seal for aggressive liquids (external)

H = Flushing

KT = Double mechanical seal

Sn = Non-standard mechanical seal

~~Kn~~ = ~~Non-standard surface treatment~~

Special impeller material:

PM = Bronze

SS = ~~stainless steel AISI316~~

Pump type	Pump L65A4SC75V-00903 SCC(1/4) O152106	Motor code marking
Serial number, Pressure class	No 225622.100 2021 PN 10 Ø 164 / mm	Impeller size
Duty point, Max liquid temperature	5,3 l/s 5,5 m 90 °C P1 kW	Electrical power at duty point
Motor type	Motor KPSC-80-2 F19 1~ 50 Hz S1	Supply voltage phase number
Nominal voltage and current	230 V 6,0 A max P2N 0,75 kW 5-25 r/s	frequency and duty type
Rotation speed, insulating and enclosure class	Isol F IP54 MEI ≥ 0,4 --	Nominal shaft power
Manufacturer, Country of origin	Kolmeks Finland D 6305-VVC3E N 6204-VVCM	Rotation speed range
		Minimum efficiency index (MEI)
		Bearing types, CE marking

1 2 3 4 5
AL - 110 2 / 4 MD B
L P - 50 A / 4 SC C

1) Pump series:

AE-, L-, AL-

2) Material of housing, sealing flange and impeller:

no letter = Grey cast iron EN-GJL-200

H = Nodular cast iron EN-GJS-400

P = Bronze CuSn10Zn2

S = Stainless steel AISI 316

3) Flange DN size:

26 = 1"

33 = 1 1/4"

32 = DN 32

40 = DN 40

50 = DN 50

65 = DN 65

106 = DN 65

80 = DN 80

110 = DN 100

112 = DN 125

115 = DN 150

4) Electric motor pole number:

2 = rotation speed 50 r/s (50 Hz)

4 = rotation speed 25 r/s (50 Hz)

rotation speed 30 r/s (60 Hz)

rotation speed 32.5 r/s (65 Hz)

5) SC = SC frequency converter integrated in pump.

MD = MD frequency converter integrated in pump:

Pump adjustment method

SCA/MDA, SCB/MDB, SCC/MDC,

SCD/MDD, SCF/MDF, SCG/MDG,

SCM/MDM

Pump installation

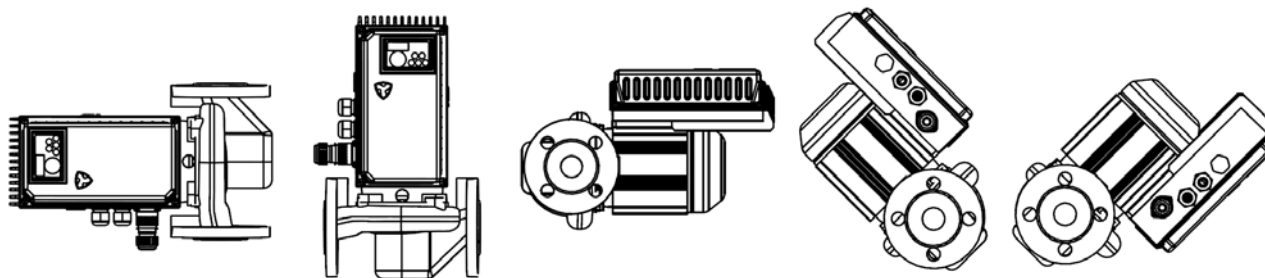
The pump can be installed in the piping without additional support up to 3kW. 4kW and above must be installed with base plate to the vertical position. The position of the motor unit and therefore the location of the frequency converter box can be changed by detaching the motor unit from the pump housing and turning it to the required position, within certain limitations.

Ensure the following when installing the pump:

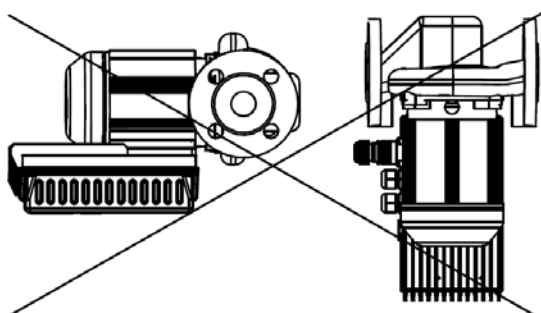
- Enough room for control, service and inspections
- The installation position should be chosen such that the display is readable; a separate control panel can be used if required.
- Possibility to use lifting and transfer devices if required
- Shut-off valves on both sides of the pump
- The pump must be installed in such a position that the frequency converter of the pump is not in the immediate vicinity of a hot pipe.

Operating positions

Permitted operating positions

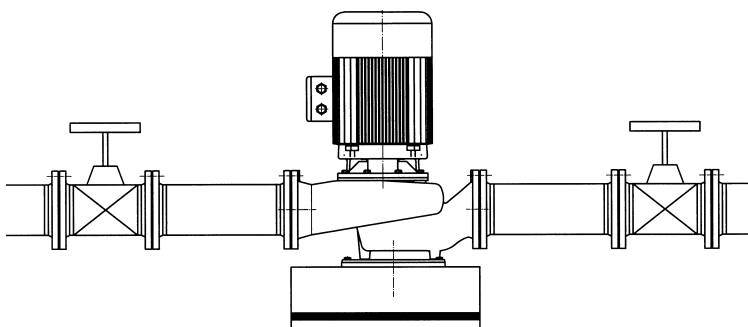


Prohibited operating positions



Recommended general limits without the base

Size	Power
DN 15 ... 50	max. 2,2 kW
DN 65	4 kW
DN 80	4 kW
DN 100	7,5 kW
DN 125	7,5 kW



Large pumps are fastened by their base plate onto a freely moving concrete plinth, which is to be separated from the floor by a 20-mm thick rubber or cork mat. The weight of the concrete base must be about 1.5 times the weight of the pump.

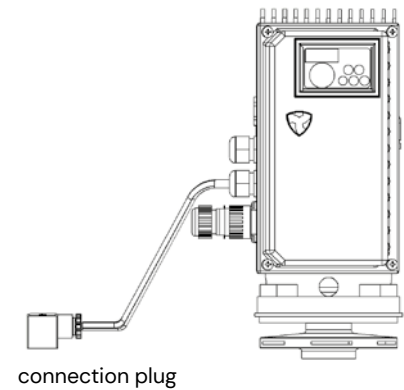
Drive unit

Exchange unit SCA/MDB-, SCC/MDC-, SCD/MDD- and SCF/MDF-pump

The complete pump motor unit is a new spare motor unit which includes:

- Electric motor
- Frequency converter
- Transmitter quick connection plug with wires
- Sealing flange
- Impeller
- Seals

When replacing the drive unit, no piping or electrical work is required, as there is no need to detach the pump housing, and the power supply is connected using a quick connection plug. There is also no need to detach the transmitter or its tubes. Only the cap screw of the plug connector at the top of the transmitter is opened, which enables the plug connector and its wiring to be pulled out. In the new drive unit, the connection plug is pre-wired, which allows quick replacement of the transmitter electrical connection.

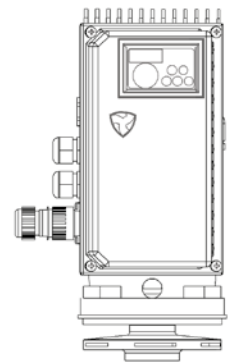


Drive unit SCA/MDA- and SCG/MDG-pump

The complete pump motor unit is a new spare motor unit which includes:

- Electric motor
- Frequency converter
- Sealing flange
- Impeller
- Seals

When the drive unit is changed, there is no need for piping work or electrical installations. When changing the MD –drive unit, electrical wiring installation is needed due to fixed mains supply connection.



Control methods and control connections

SC pump I/Os (inputs and outputs)

Terminal 4	Programmable 4–20 mA, 0–5 VDC, 0–10 VDC analog input (voltage/current selection switch)
Terminal 2	Programmable 0–10 VDC, 0–5 VDC analog input
Terminals STF, STR, RH, RM, RL	Programmable digital inputs
Terminal PC	24 VDC voltage supply for digital inputs and feedback transmitter (max. 100 mA)
Terminal 10	5 VDC voltage supply for potentiometer
Terminal 5	Signal ground
AM / 5	Programmable analog output
Relay output, Terminals A,B, C	Fault indication (programmable relay output), potential free change-over contacts max. 230 VAC / 0.3 A, cos ϕ 0.4, max. 30 VAC / 0.3 A
Transistor output, Terminals RUN, SE	Load 27 V / 0.1 A, voltage loss 3.4 V

Terminal factory settings

Terminal 4	Programmed as feedback input 4–20 mA or not in use depending on the pump control method
Terminal 2	0–10 VDC direct speed reference or controller reference depending on control method used, or not in use.
Terminal STF	Jumper between terminals PC–STF open/closed = pump off/on (In SCB- and SCC –pumps the external switch for pump on/off is connected between terminal 8 of the additional measurement card and terminal STF.)
Terminal STR	Not in use
Terminal RH	Dry running protection in the SCD version
Terminal RM	Jogging operation. PC – RM open/closed = normal operation / runs forced at 40 Hz frequency.
AM / 5	Analog output 0–10 VDC. SCCVAK (direct speed reference from automation) and in SCG versions programmed as frequency. SCB, SCC, SCCVAK (differential pressure reference from automation), in SCD and SCF version programmed as feedback.
Relay output, Terminals A,B ja C	The relay output is programmed with fault information. The relay draws: Terminals A and C connected, when the pump runs or voltage is connected to it. Terminals B and C connected, when the device is in fault mode or dead.

MD-pump terminal factory settings

Type		Description	Functionality	Comments
Analog inputs	AN1	4-20 mA	Sensor 1	-
	AN2	4-20 mA	Sensor 2	-
	AN3	0-10 V	External set value	
	AN4	0-10 V	External frequency External set value 2	
Power Supply	+15V	15 VDC, max 100 mA	Power supply for 4-20 mA analog inputs	Do not use as a power supply for the digital inputs!
Power Supply	+10V	10 VDC, max 3 mA	Power supply for 0-10 V analog inputs	Do not use as a power supply for the digital inputs!
Signal GND	0V	Insulated	Signal GND for analog and digital inputs	-
Digital inputs	IN1	Active low	Motor start and stop	Programmable as Normally Open or Normally Closed.
	IN2	Active low	Motor start and stop Switching of set value 1 and 2 Switching of work frequency 1 and 2	Programmable as Normally Open or Normally Closed.
	IN3	Active low	Motor start and stop Switching of sensors 1 and 2	Programmable as Normally Open or Normally Closed.

Type		Description	Functionality	Comments
	IN4	Active low	Alarms reset Motor start and stop Switch between main and auxiliary control modes	Programmable as Normally Open or Normally Closed.
Relay outputs	NO1	Normally Open	STATUS relay	Potential-free contacts
	COM 1	Common	NO1, COM1: closed contact with motor running.	Max 250 VAC, 2 A
	NC1	Normally Closed	NC1, COM1: closed contact with motor stopped.	Max 30 VDC, 2 A
Relay outputs	NO2	Normally Open	ALARM relay	Potential-free contacts
	COM 2	Common	NO2, COM2: closed contact without alarm.	Max 250 VAC, 2 A
	NC2	Normally Closed	NC2, COM2: closed contact with alarm or without power supply.	Max 30 VDC, 2 A
RS485 serial port	S1+	Positive	Communication	-
	S1-	Negative	COMBO	-
	G	Serial GND		The serial GND is isolated from the signal GND
RS485 serial port	S2+	Positive	Communication	-
	S2-	Negative	MODBUS RTU	-
	G	Serial GND		The serial GND is isolated from the signal GND

SCA- / MDA-pump: Direct speed reference by potentiometer

Applications

For systems with no continuous automatic adjustment requirement and a constant duty point, such as domestic hot water circulation systems, for example.

Accessories

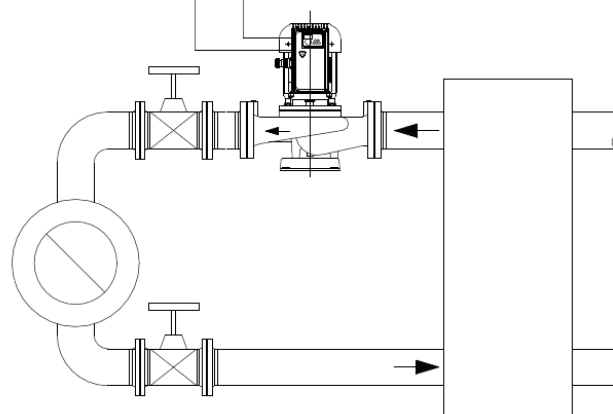
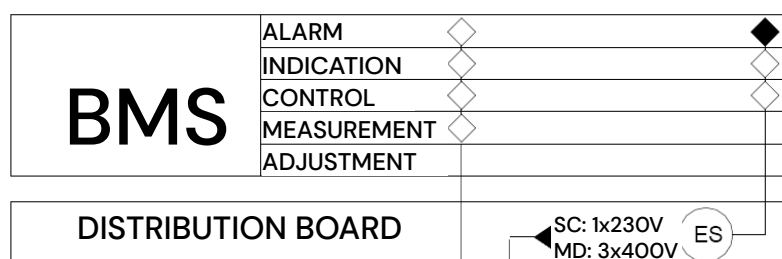
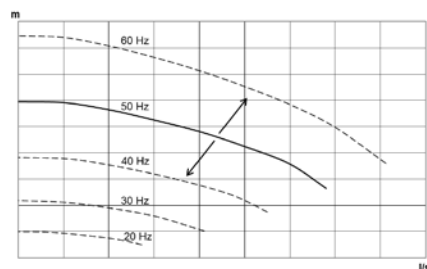
Pump and frequency converter.

Operating principle

The rotation speed of the pump is set in one step using the buttons on the frequency converter when commissioning the pump. In MD -pump it is recommended to use Mobile application via Bluetooth

Pump curve

The pump QH curve equals the QH curve of a standard speed pump.



SCB- / MDB-pump: Constant differential pressure across pump

Applications

For circulation systems where flow rates vary and the majority of pressure loss is created at consumption targets. For example, heating and cooling systems and pressure boosting in parallel circulation systems.

Accessories

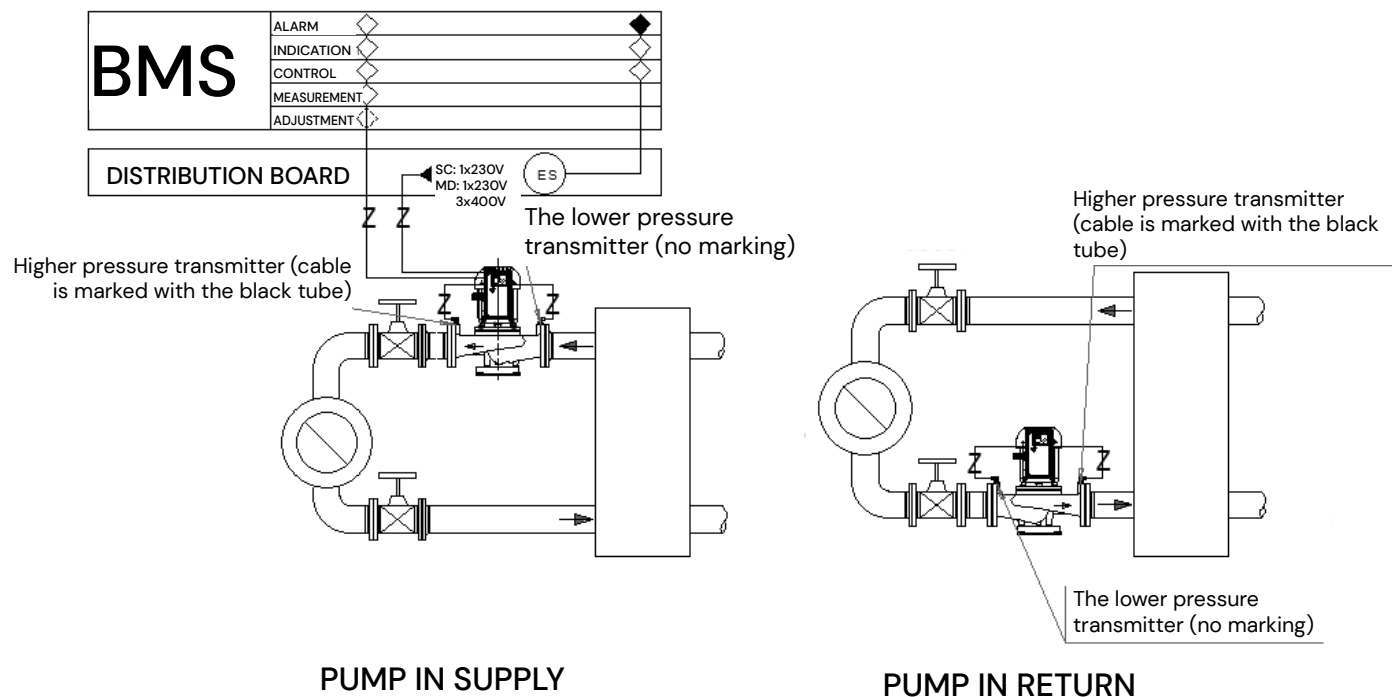
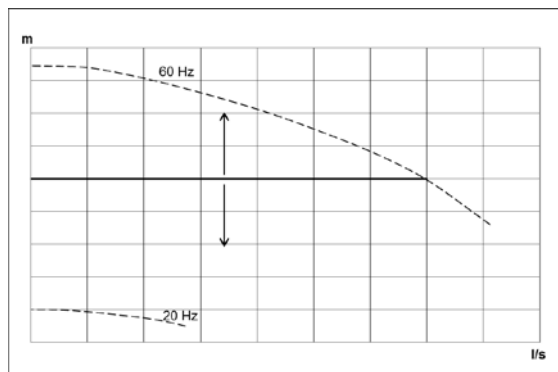
Pump, frequency converter, differential pressure transmitter and measurement pipes installed in the suction and discharge flanges of the pump. The higher pressure transmitter cable is marked with the black tube. The lower pressure transmitter has no markings.

Operating principle and system adjustment

The differential constant pressure is maintained between the pump flanges, which is set up with the buttons of the frequency converter. In MD -pump it is recommended to use Mobile application via Bluetooth

Pump curve

The QH curve of the pump is horizontal, which is applicable for circulation systems where the pressure loss of the heat source is low in relation to the total pressure loss.



SCC- / MDC-pump: Constant differential pressure in piping

Applications

For circulation systems where flow rates vary significantly and the majority of pressure loss is created at consumption targets. For example, heating and cooling systems and pressure boosting in parallel circulation systems.

Accessories

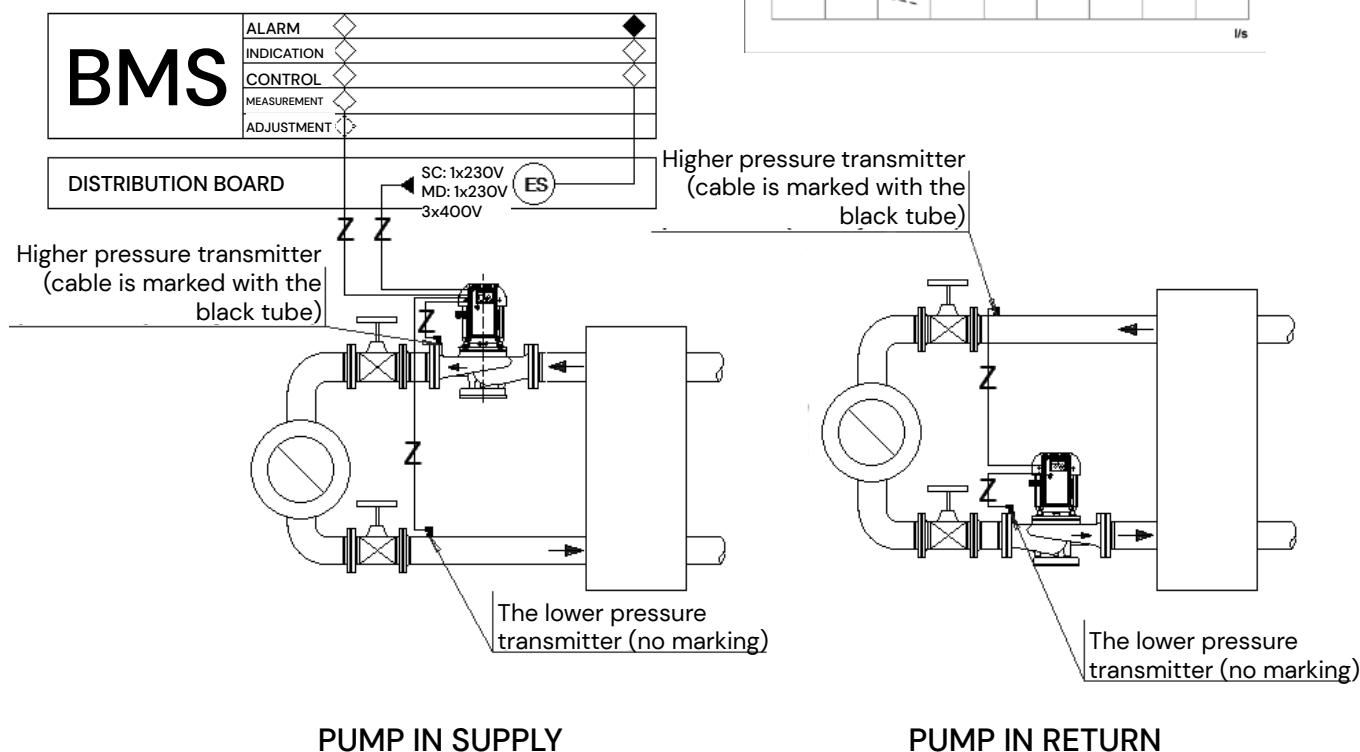
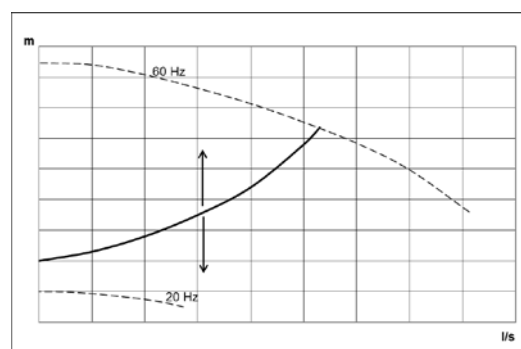
Pump, frequency converter, differential pressure transmitter with pipes, one of which is installed in the suction or pressure flange in the pump and the other in the system's inlet or outlet pipe. The higher pressure transmitter cable is marked with the black tube. The lower pressure transmitter has no markings.

Operating principle and system adjustment

The differential constant pressure is maintained between the supply and return pipes, which is set up with the buttons of the frequency converter. In MD -pump it is recommended to use Mobile application via Bluetooth.

Pump curve

The pump QH curve is automatically square. The shape of the QH curve depends on the relation of the heat source pressure loss to the total pressure loss of the circulation system. The larger the share of the heat exchanger pressure loss is in relation to the circulation system's total pressure loss, the steeper the QH curve is.

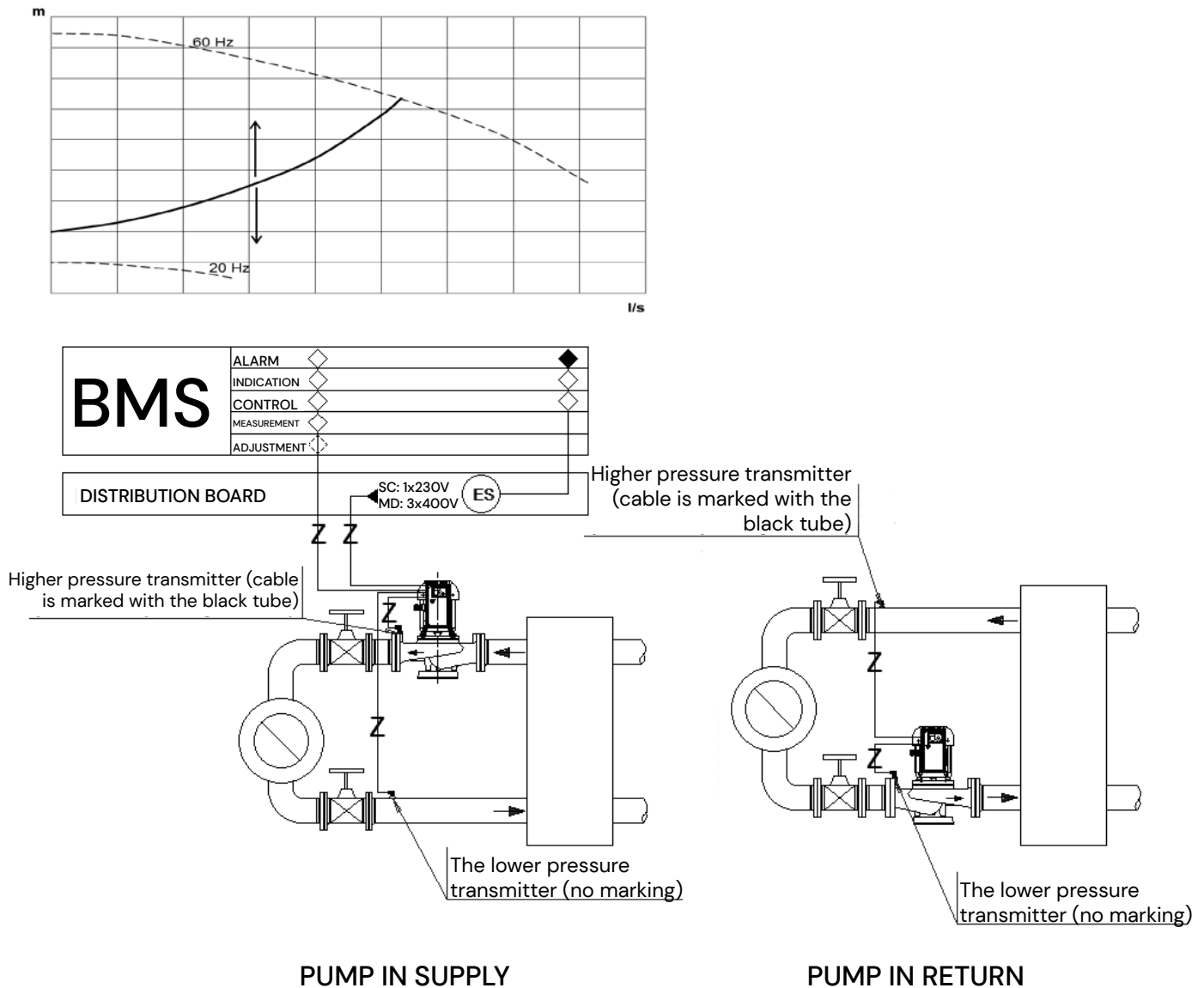


SCCVAK- / MDCVAK-pump: Constant differential pressure in piping by frequency converter PI-controller

Operating principle

Constant differential pressure is maintained over the inlet and outlet line of the system by setting it in the BMS (differential pressure reference value as voltage current signal 0–10 V). These connections and operation are the same as for the SCC- / MDC-pump.

NOTE! If the BMS is not operational when pumping is required, set the differential pressure with the buttons of the frequency converter. In MD -pump it is recommended to use Mobile application via Bluetooth



SCD / MDD-pump: Constant pressure in discharge flange (pressure boosting)

Applications

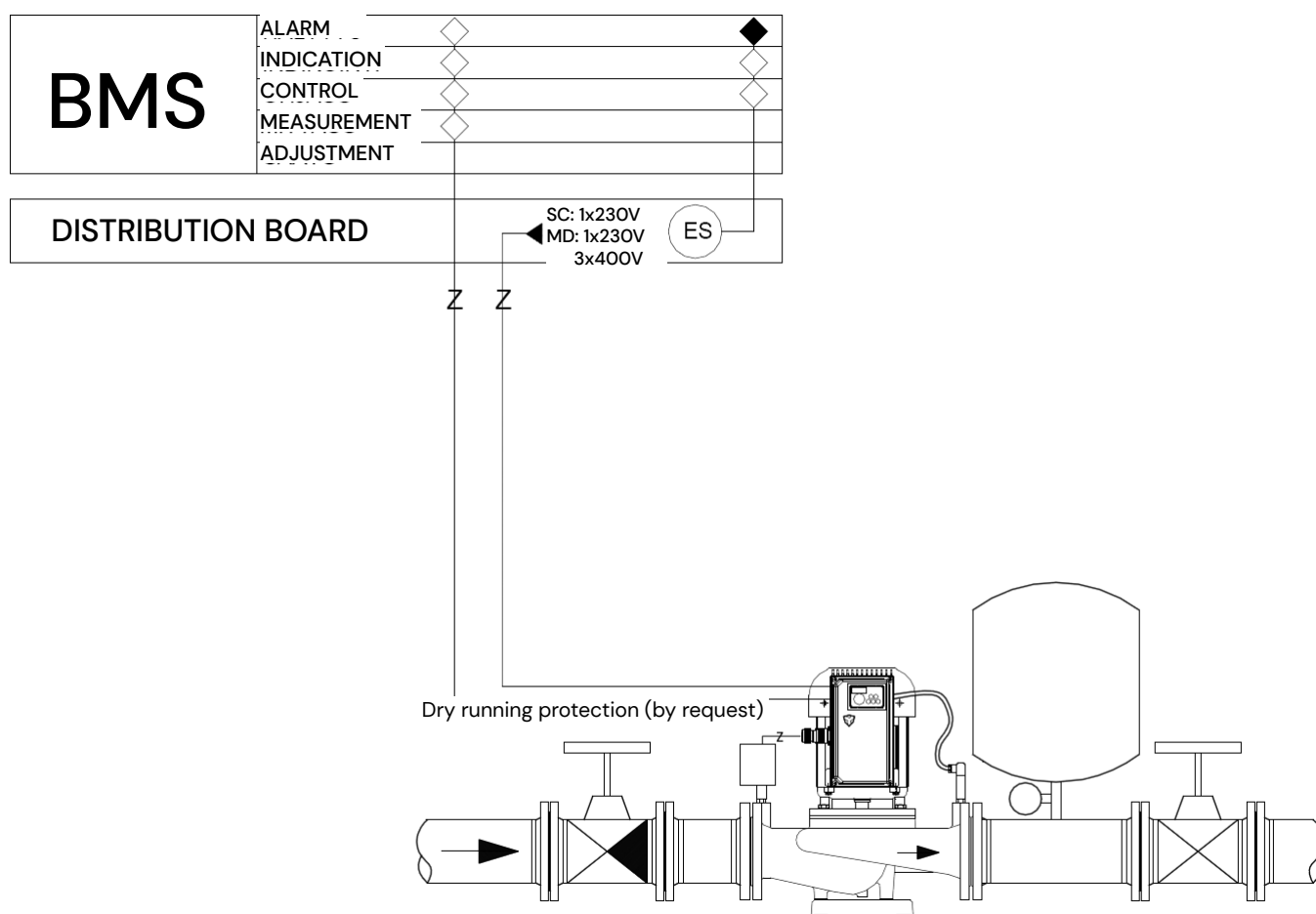
For pressure boosting and other open systems which require a constant pressure.

Accessories

Pump, frequency converter and pressure transmitter which is installed either on the pump discharge flange or consumption point.

Operating principle

The constant discharge pressure is maintained, which is set up with the buttons of the frequency converter
In MD -pump it is recommended to use Mobile application via Bluetooth



SCF- / MDF-pump: Constant temperature

Applications

For heating or cooling systems which maintain constant temperature by adjusting the flow rate.

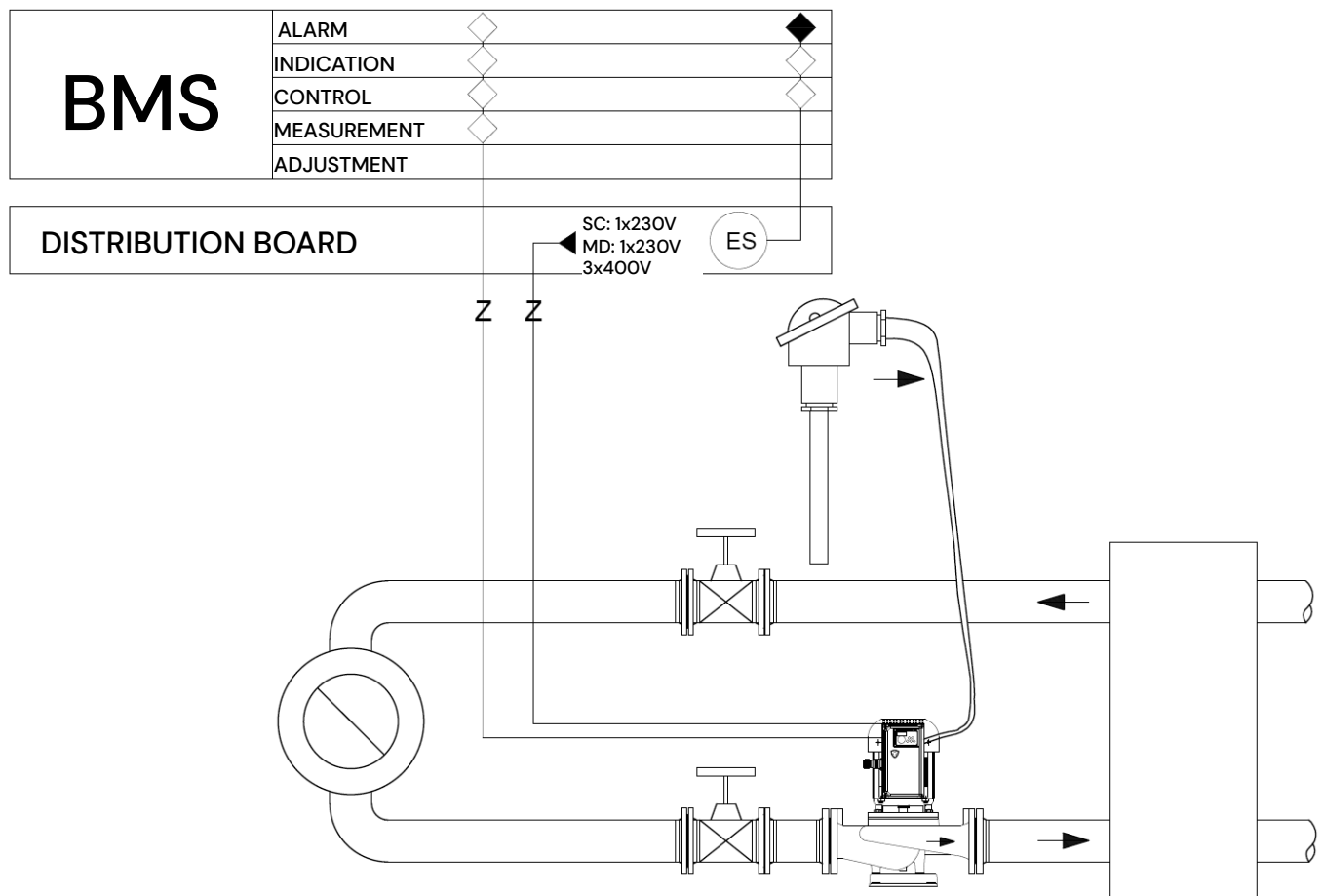
Accessories

Pump, frequency converter and temperature transmitter.

Operating principle

The constant temperature is maintained, which is set up with the buttons of the frequency converter. In MD-pump it is recommended to use Mobile application via Bluetooth

NOTE! Regulation mode is needed when ordering the pump. NORMAL: Speed decreases when feedback higher than reference (heating system). INVERSE: Speed increases when feedback higher than reference (cooling system).



SCG- / MDG-pump: Pump speed controlled by external automation

For systems with varying flow rates and/or in which the flow rate is adjusted using the pump. The pump is controlled centrally or by a separate controller.

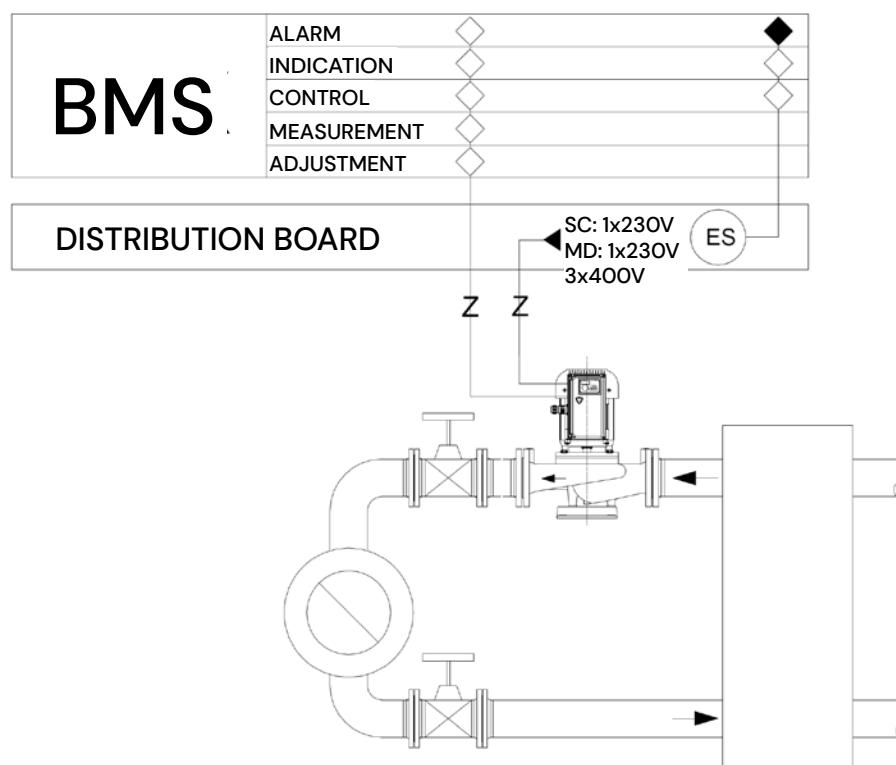
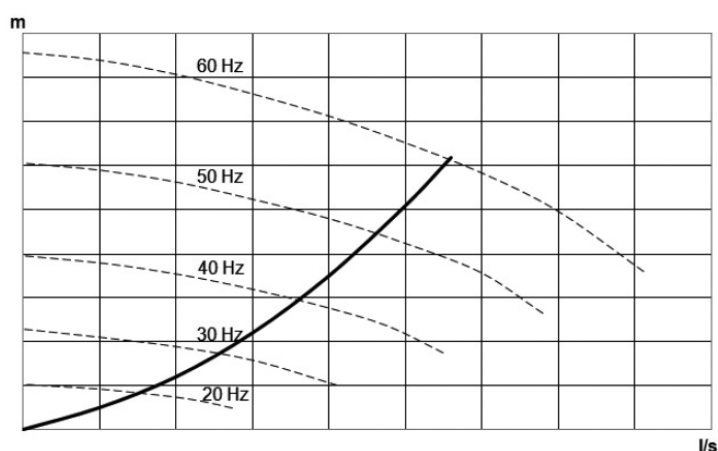
Accessories

Pump and frequency converter.

Operating principle

The pump is given a direct speed reference externally e.g. from the BMS, a separate controller, process control, etc.

NOTE! If the BMS is not operational when pumping is required, the standard speed of the pump can be set in the same way as for an SCA-/MDA- pump.



SCM- / MDM-pump: Automation controlled pump with MODBUS RTU bus

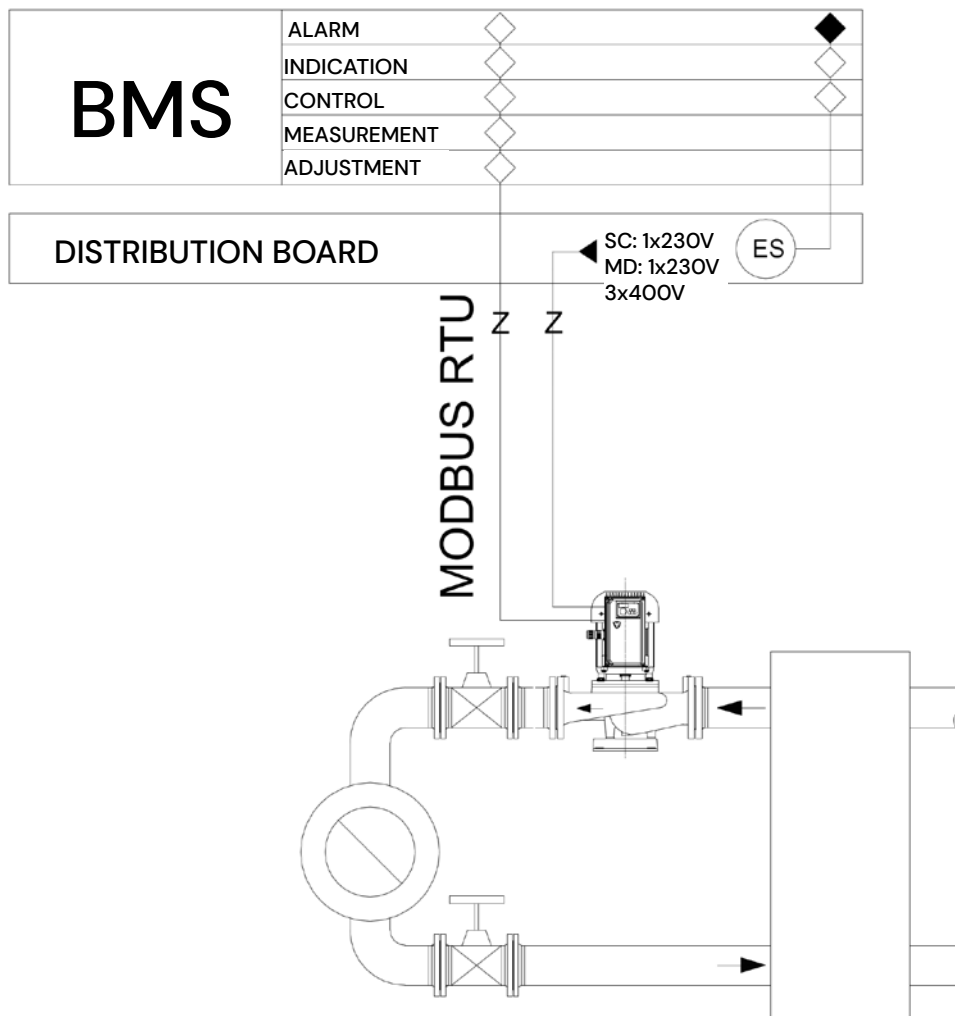
For systems with varying flow rates and/or in which the flow rate is adjusted by the pump. The pump is controlled centrally or by a separate controller.

Accessories

Pump and frequency converter.

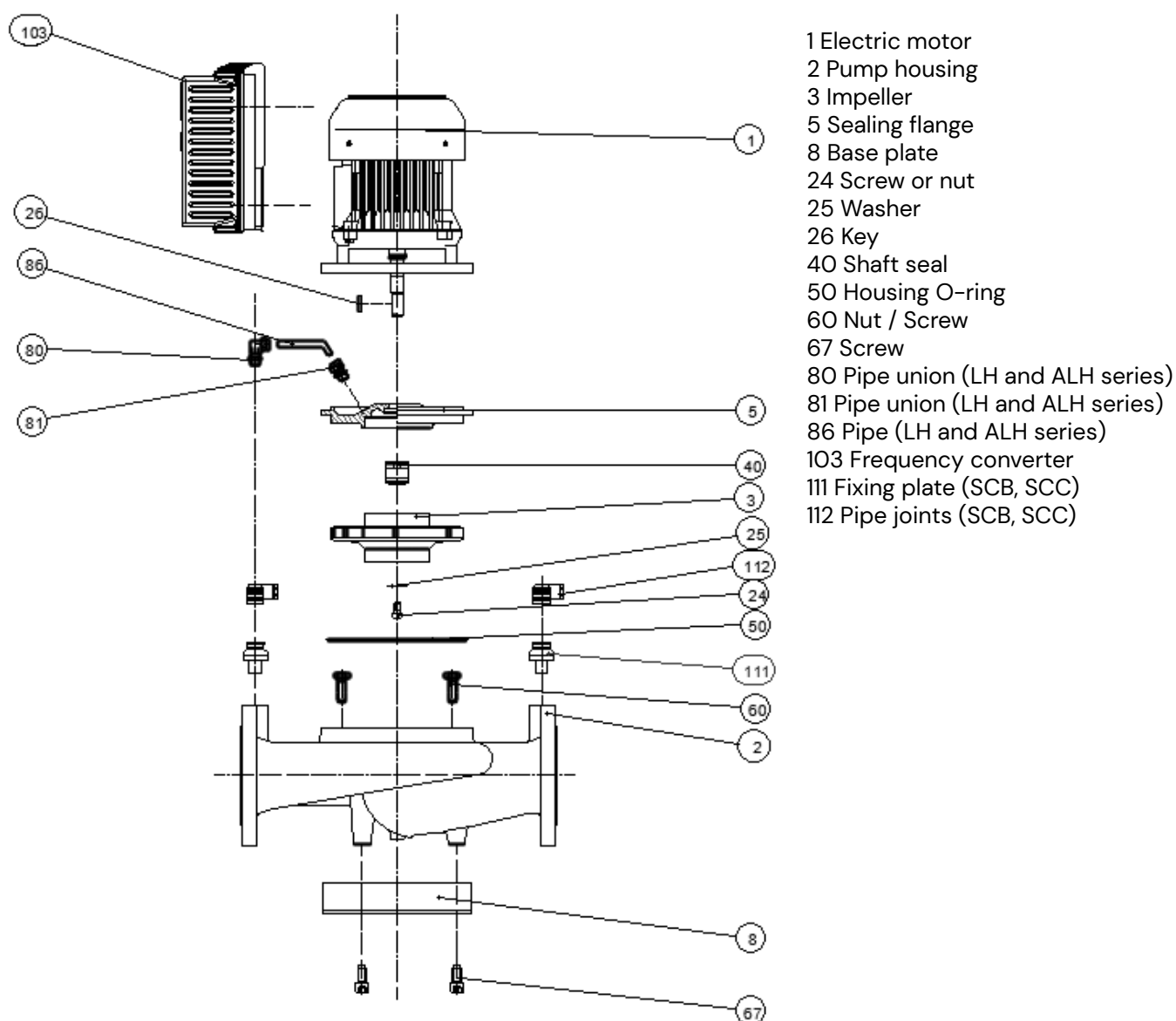
Operating principle

The adjustment, control, measurement, indication and alarms of the pump frequency converter is carried out externally using building automation, process control, or by means of MODBUS RTU bus functions.



NOTE! The following serial bus connection option cards are available for MD –pumps by request: Lonworks, Profibus DP, CANopen, Devicenet MODBUS TCP, Profinet ja Ethernet IP.

Pump parts

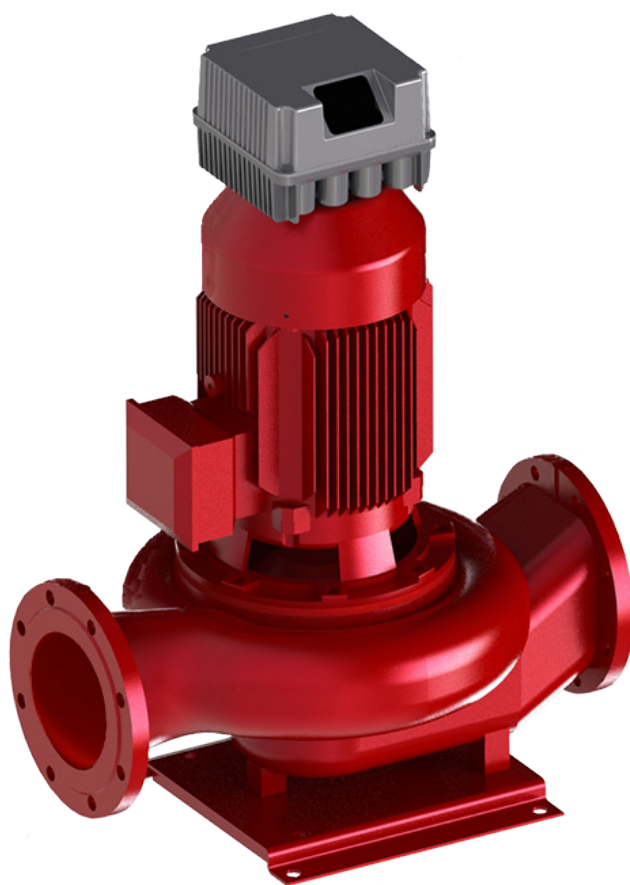


When ordering spare parts, please state the pump type, serial number, duty point, impeller size, electric motor type and power. These can be found on the rating plate.

TECHNICAL INFORMATION

CIRCULATING PUMPS TO THE POWER PLANTS AND PRIMARY SIDE OF DISTRICT HEATING SYSTEMS, INLINE

INLINE PUMPS WITH INTEGRATED NC FREQUENCY CONVERTER,
1,1 – 3kW 1X230V
4 – 15kW 3X400V



General technical data

NC series of Kolmeks circulation pumps and variable speed controlled centrifugal pumps with integrated frequency converter.

Applications

NC series pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.

- Bronze NC pumps can be used as domestic hot water, circulation, pressure boosting and transfer pumps for clean, oxygen-rich and some slightly aggressive liquids.
- Stainless steel AISI316 NC pumps can be used as circulation, pressure boosting and transfer pumps for clean and aggressive liquids.

The most common applications of the NC pump series are heating, ventilation, cooling and heat recovery systems, heat exchangers, pressure boosting, district heating plants, ice rinks, swimming pools, spas and industrial processes.

Structure

Pump

NC series pumps are monoblock-structured centrifugal pumps with a dry asynchronous motor, which fulfill the requirements of EcoDesign –directive. A frequency converter is integrated into the motor. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Electric motor

The electric motor of an NC pump is a three-phase Kolmeks asynchronous motor designed specifically for pump use and frequency converter operation, which guarantees high starting torque and low energy consumption. The electric motor is highly efficient and has low noise levels. Moottori täyttää EcoDesign-direktiivin vaatimukset.

Supply voltage:	1,1 – 3kW 1 x 230 V, 50 Hz 4 – 15kW 3 x 400 V, 50 Hz
Enclosure class:	IP 54
Insulation class:	F
Duty type:	Continuous Duty (S1)
Ambient temperature:	0°C ... +40°C

Connections

Flanged:

The flanges of NC pump fit counter-flanges dimensioned according to ISO 7005.

Threaded:

The NC pump threads are dimensioned according to Standard ISO 228/1.

Seals

The standard shaft seal of an NC series pump is a single mechanical seal. The pump housing seal is O-ring or flat gasket.

Other seal options are available by request.

Other Technical Data

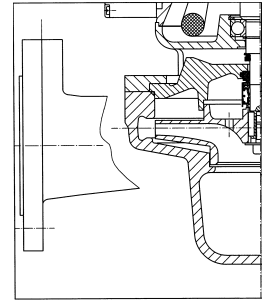
See the section Technical Data of SC- and MD –pumps.

Seal structure alternatives

Standard structure

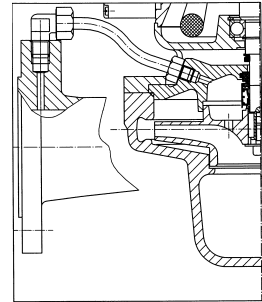
- Single mechanical seal
- Max. operating temperature +120°C.

The standard-construction shaft seal can also be used for water-glycol mixtures and most other indirect refrigeration systems. The recommended glycol is propylene glycol with a concentration of up to 50%. Most often, a concentration of 30–40% is adequate.



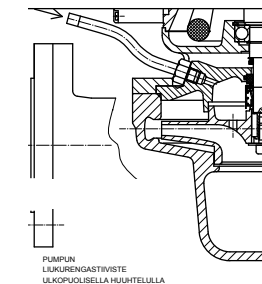
Internal flushing

- Single mechanical seal
- Recirculation from the discharge flange of the pump to the seal chamber which flushes the seal
- Max. +150°C water
- Available for flange sizes DN50 ... DN300. . This is indicated with an additional marking 'H' in the pump type e.g. LS-65B/4H.



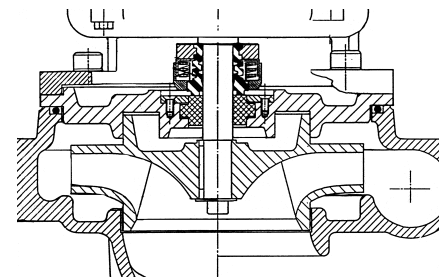
External flushing

- Single mechanical seal
- A pipe from an external source plugged to the seal chamber, which makes it possible to flush the seal with external pressure if required
- Available for pumps in flange sizes DN 50–300 pumps
- Crystallising and accumulative liquids



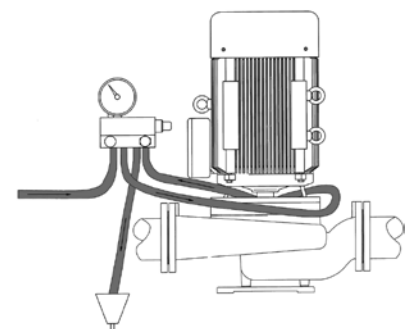
External seal

- Externally-mounted single mechanical Teflon bellows
- Available for flange sizes DN 65–300 ALS pumps
- Extremely corrosive liquids, e.g. sulfuric acid
- Marking 'T' in the pump type e.g. ALS-1065/4T
- NOTE! Maximum working pressure 10 bar



Double mechanical seal system (cartridge)

- Two opposing seals with sealing liquid brought from outside (circulation). The pressure of the liquid can be lower or higher than that of the liquid being pumped
- Available for flange sizes DN 65–300 pumps
- Max. operating temperature +180°C for water
- Requires a separate seal water monitoring unit (available from Kolmeks)
- Marking 'KT' in the pump type e.g. ALS-1154/4KT
- Hot, crystallizing and accumulative liquids



NC - pump standard materials and fields of application

Connection G or DN	Grey cast iron EN-GJL-200, PN10	Nodular cast iron EN-GJS-400, PN16	Bronze CuSn10Zn2, PN10	Stainless steel AISI 316, PN 16	Shaft seal PN10 Ø [mm] materials	O-ring size [mm]	O-ring material	Motor [kW]
G1	AE-26/2 NC	-	AEP-26/2 NC	-	12, carbon/SiC Viton	123 X 2,5	NBR	1,1
G1 1/4	AE-33/2 NC	-	AEP-33/2 NC	-	12, carbon/SiC Viton	145 X 2,5	NBR	1,1 and 1,5
DN 32	L-32A/2 NC	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	1,1
DN 40	L-40A/2 NC	-	-	-	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1 and 1,5
DN 50	L-50B/2 NC	-	LP-50B/2 NC	-	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	L-50C/2 NC	LH-50C/2 NC	LP-50C/2 NC	-	18, carbon/SiC EPDM	150 X 3	NBR	1,5, 2,2, 3 and 4
	L-50D/2 NC	LH-50D/2 NC	LP-50D/2 NC	-	18, carbon/SiC EPDM	150 X 3	NBR	1,5, 2,2, 3 and 4
DN 65	L-65A/4 NC	LH-65A/4 NC	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,1 1,5, 2,2 and 3
	L-65B/2 NC	LH-65B/2 NC	-	LS-65B/2 NC	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5, 2,2, 3, 4, 5,5 and 7,5
DN 80	L-80A/4 NC	LH-80A/4 NC	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,1, 1,5, 2,2 and 3
	L-80A/2 NC	LH-80A/2 NC	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4, 5,5 and 7,5
	L-80S/4 NC	LH-80S/4 NC	-	-	28, carbon/SiC EPDM	265 X 4	EPDM	2,2, 3, 4, 5,5 and 7,5
DN 100	AL-1102/4 NC	ALH-1102/4 NC	ALP-1102/4 NC	ALS-1102/4 NC	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,1, 1,5, 2,2 and 3
	AL-1102/2 NC	ALH-1102/2 NC	ALP-1102/2 NC	ALS-1102/2 NC	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4, 5,5 and 7,5
	L-100S/4 NC	LH-100S/4 NC	-	-	32, carbon/SiC EPDM	315 X 6,3	EPDM	4, 5,5, 7,5, 11 and 15
	AKN-100/2 NC	AKNH-100/2 NC	-	-	25, carbon/SiC EPDM	240 X 3	NBR	11 and 15
DN 125	AL-1129/4 NC	ALH-1129/4 NC	-	ALS-1129/4 NC	32, carbon/SiC EPDM	309/295X1	gasket	3, 4, 5,5, 7,5, 11 and 15
DN 150	AL-1154/4 NC	ALH-1154/4 NC	-	ALS-1154/4 NC	32, carbon/SiC EPDM	309/295X1	gasket	5,5, 7,5, 11 and 15
DN 200	AL-1202/6 SD NC	ALH-1202/6 SD NC	ALP-1202/6 SD NC	ALS-1202/6 SD NC	32, carbon/SiC EPDM	309/295X1	EPDM	5,5, 7,5 and 11
	AL-1202/4 NC	ALH-1202/4 NC	ALP-1202/4 NC	ALS-1202/4 NC	32, carbon/SiC EPDM	315 X 6,3	EPDM	15
DN 250	AL-1250/6 SD NC	ALH-1250/6 SD NC	-	ALS-1250/6 SD NC	40, carbon/SiC EPDM	405 X 7	EPDM	15, 18,5 and 22
	AL-1250/6 SD NC	ALH-1250/6 SD NC	-	ALS-1250/6 SD NC	50, carbon/SiC EPDM	405 X 7	EPDM	30
	AL-1250/4 NC	ALH-1250/4 NC	-	ALS-1250/4 NC	40, carbon/SiC EPDM	405 X 7	EPDM	37
	AL-1250/4 NC	ALH-1250/4 NC	-	ALS-1250/4 NC	50, carbon/SiC EPDM	405 X 7	EPDM	45

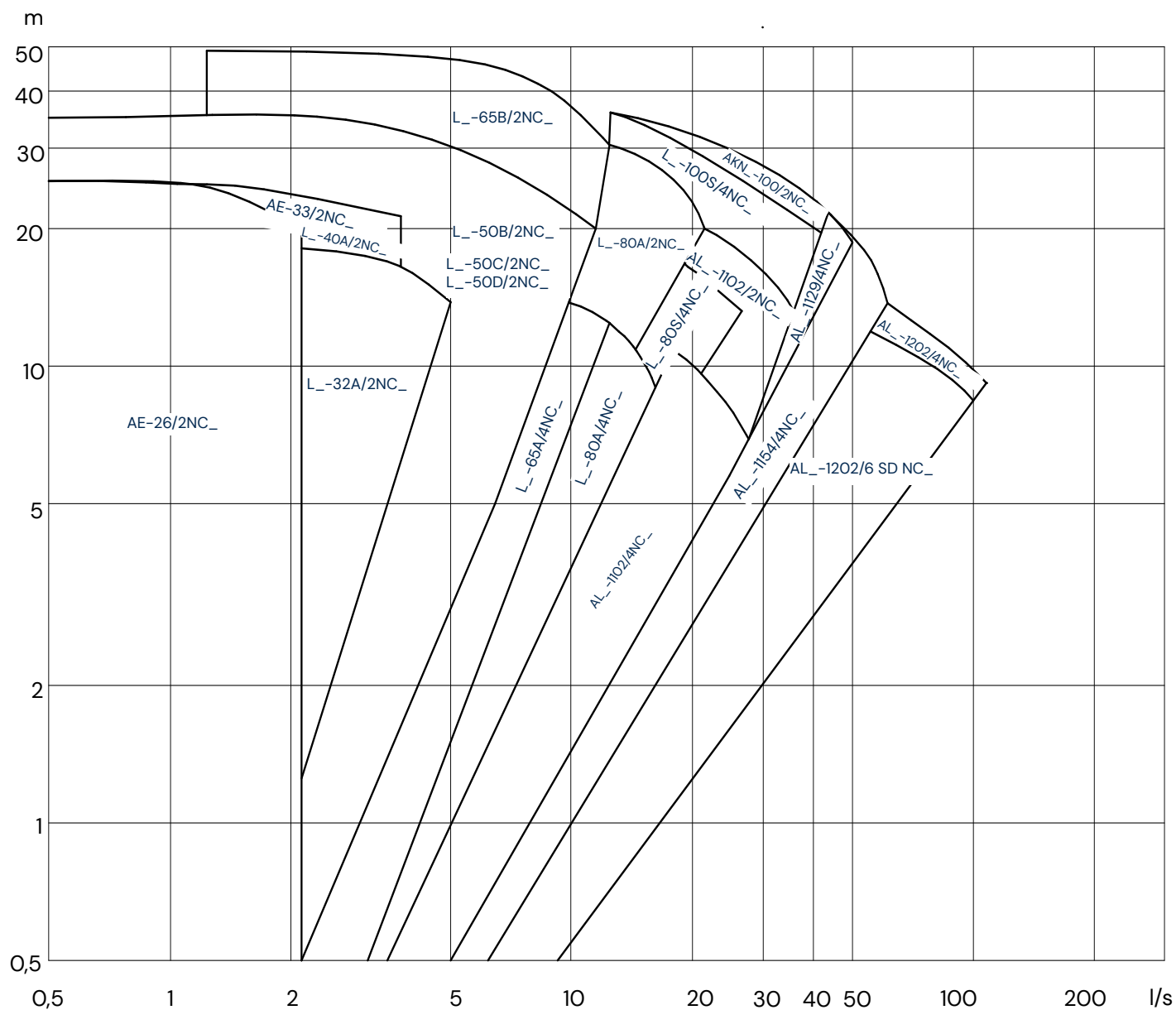
AL_-1202/6 and AL_-1250/6 are SD-pumps.

Operating temperature -15...+180 °C (Max. temperature is depending on medium and the type and construction of the mechanical seal)

PN10 = Max. working pressure 10bar, grey cast iron and bronze

PN16 = Max. working pressure 16bar, nodular cast iron and stainless steel

Quick selection chart NC-pump



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