![Bitzer logo](DAS HERZ DER FRISCHE)

EXTERNAL
FREQUENCY INVERTERS

VARIPACK

INTELLIGENT PRODUCTS

BEST SOFTWARE

ECODESIGN CONFORM

BITZER Innovation Targets

Products for refrigerants with low global warming potential (GWP

// For naturally appearing substances

// For new refrigerants like R1234yf, R1234ze(E) and low-GWP blends

These refrigerants reduce the direct contribution of refrigeration systems to global warming.

Products with high efficiency at full and part load

// Efficiency improvements of motor and mechanics

// High system efficiency in part load operation

  – by optimised mechanical capacity regulation

  – by specially developed frequency inverters

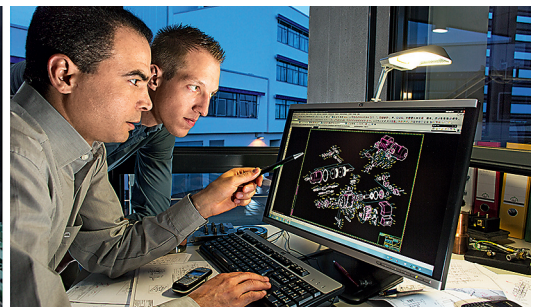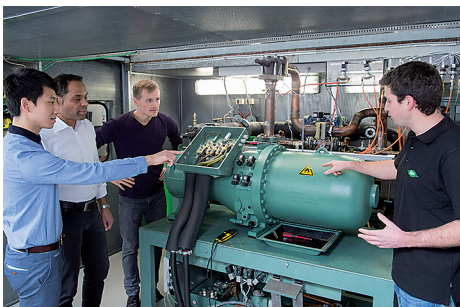This reduces the indirect contribution to global warming by saving energy.

Simple handling and serviceability with advanced electronic modules

// Electronic components for

  – data logging

  – capacity regulation

  – actuation of accessories

// Unified user software for simple configuration. Choose compressor or condensing unit and refrigerant. Ready.

This makes it simple to fully utilize the efficiency potential of our products and optimise operation.

VARIPACK – External BITZER Frequency Inverters

A frequency inverter series for all BITZER compressors

For easy and safe capacity control, BITZER VARIPACK series offers a new generation of intelligent frequency inverters that can be used with all BITZER compressors.

The new VARIPACK frequency inverter series was again specially developed for refrigeration and operation of BITZER refrigeration compressors. The focus of the development was the easy use, the reliability and the high performance of the frequency inverters. They can be, for example, put into operation intuitively and perform control functions of the refrigeration system.

The optimised adaptation to the current cooling demand of a system reduces energy consumption effectively and thus costs.

It can be saved twice thanks to the high efficiency of the frequency inverters and optimised adaptation to the compressors.
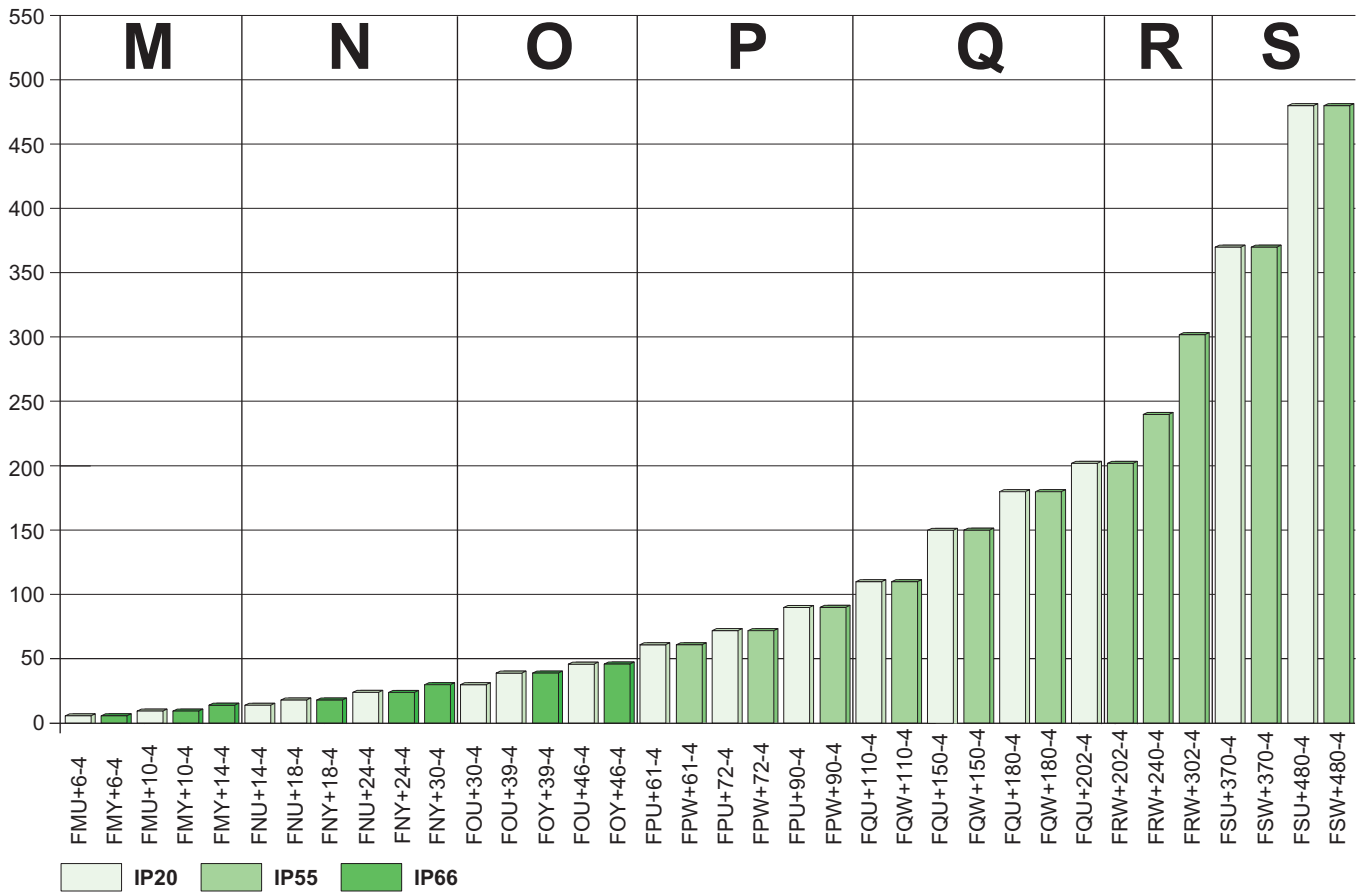
FREQUENCY INVERTER

F.Y	**F.U**	**F.W**
IP66	IP20	IP55

Program overview

The VARIPACK frequency inverters offer a wide capacity range.

Rated output current (A)

Legend: IP20 / IP55 / IP66

Explanation of type designation

Example

F O U + 39 - 4

Identification letter for device: F = frequency inverter

F **O** U + 39 - 4

Identification letter for housing size

F O **U** + 39 - 4

IP enclosure class / housing: U = IP20, W = IP55, Y = IP66

F O U + **39** - 4

Code for power stack

F O U + 39 - **4**

Code for voltage: 4 = 400 V

Design

BEST interface converter or Modbus RTU

Slot for extension module

Control terminals

Relay contacts "Compressor ready" "Compressor running"

Main power supply

Motor connection
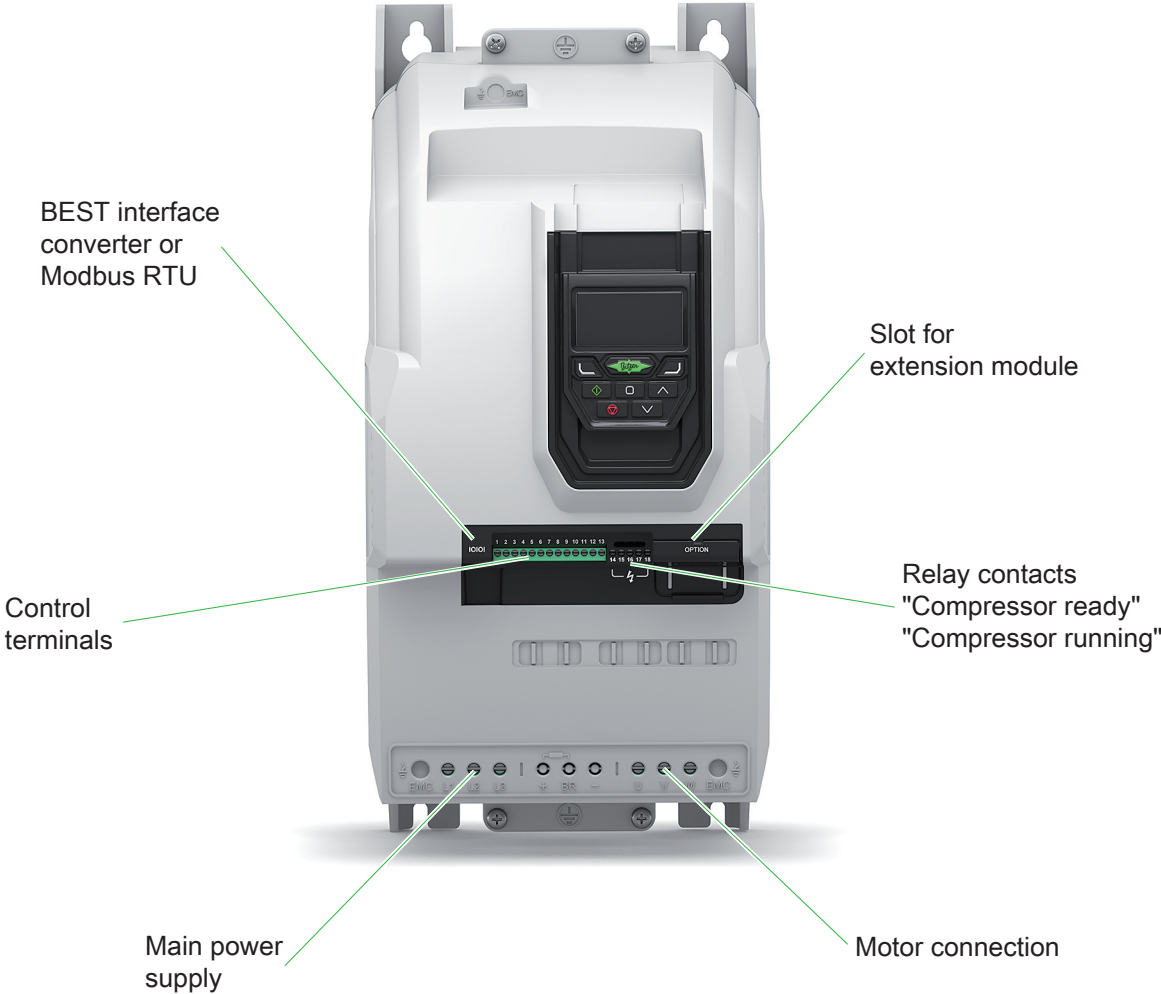
The decisive features

Control options

The VARIPACK frequency inverters can be operated in two different operating modes:

// Capacity control of the compressor depending on an external set point signal or with Modbus

// Capacity control of the compressor depending on the evaporation temperature (with optional extension module for system control – the functionality of the higher-ranking system controller is taken over).

Additionally to the direct control of the evaporation temperature, the condenser fan can also be controlled via a 0 – 10 V output signal, and a second compressor can be switched on.

Properties

// Simple
  – Optimum, application-specific selection of the frequency inverter by using the BITZER SOFTWARE
  – Stored databases enable complete configuration of each compressor via BEST SOFTWARE by simply selecting the type of the compressor
  – Operation and monitoring by using the BEST SOFTWARE
  – The frequency inverter speaks the "refrigeration language"

// Safe
  – VARIPACK + BITZER compressors are adapted to each other, tested and optimised
  – Selection of pre-configured data records prevents incorrect parameterisation
  – High starting current reserve and special starting procedures for a safe start of the compressor
  – Especially developed for BITZER refrigeration compressors
  – FMY+6 to FPW+90, FSW+370, FSW+480 and FMU+6 to FSU+480 are equipped as standard with EMC filter for class C2

// Intelligent
  – When operating in the field weakening area, the maximum frequency is automatically limited according to the load
  – Data for over 60 refrigerants are selectable

// Added value
  – System control is possible via extension module
  – Safe Torque Off (STO): load contactor is not necessary
  – Modbus RTU

// Efficient
  – High efficiency of the frequency inverter
  – Designed for refrigeration compressors
    • Parameter set for exactly the selected compressor model
    • Adjusted to motor and load as best possible
  – Safe and quick setup

IQ INTELLIGENT PRODUCTS

Interfaces

// Modbus RTU
// BEST SOFTWARE via BEST interface converter

Fields of application

// In refrigeration systems, air-conditioning systems and heat pumps
// With single compressors and in compound systems
// In supermarkets, hotels, in gastronomy and in food production and processing

Selection and assignment

The VARIPACK frequency inverters are completely integrated in the BITZER SOFTWARE and can be found under the button "Accessories".

The flexible use of the VARIPACK frequency inverters in combination with the BITZER SOFTWARE makes it possible to select the optimum combination of compressor, motor and frequency inverter for every application.

The visualisation of the resulting application limit allows you to create an economic but yet operationally safe selection for every application, even without any extensive special knowledge of frequency inverters and manual calculation steps.

BITZER SOFTWARE
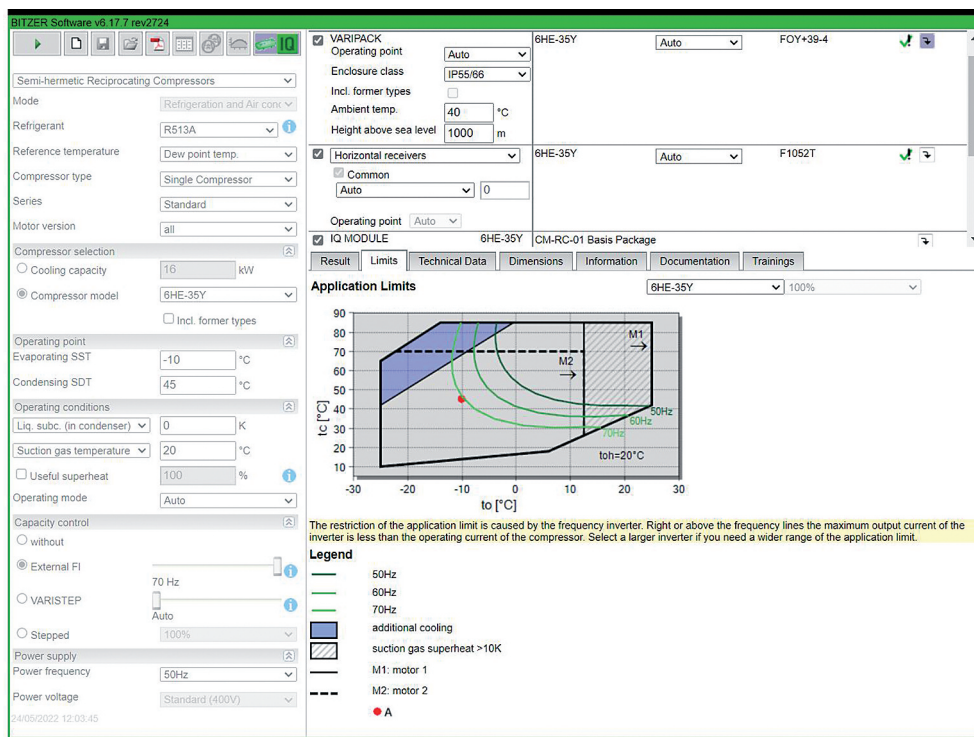
Operation

Basic configuring of the VARIPACK frequency inverters for compressor and refrigerant must be done with the BEST SOFTWARE. All other parameters can be set via the BEST SOFTWARE or the display.

In both cases, importance was put on a simple and intuitive operation.
Nevertheless, the BEST SOFTWARE presents the most user-friendly variant, among others, because of the display.
For example, in the BEST SOFTWARE, the parameters are output in full text. The complete setting of the frequency inverter can also be saved by a click, or be reset to the factory settings.
If a fault occurs, the possible causes of each specific error will be listed. Thus the cause of the error, which is often system-related, can usually be found and eliminated on-site without further help.

The communication between the BEST SOFTWARE and the VARIPACK frequency inverters is established by using the BEST interface converter.

Mounting options

The VARIPACK frequency inverters can be installed in different ways but must be mounted free from vibration and in a vertical position. IP20 units are intended for the installation in a switch cabinet.

Because frequency inverters give off heat during operation the minimum clearances for ventilation must also be observed to avoid overheating.
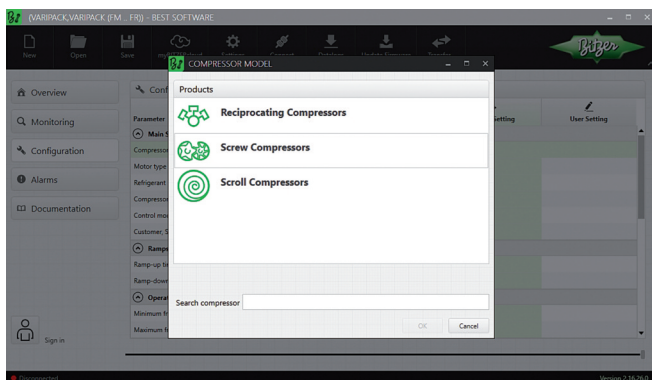
BEST SOFTWARE

Optional accessories

BEST interface converter

A personal computer with BEST SOFTWARE can be connected to the frequency inverters via BEST interface converter. The adapter cable required is supplied since March 2021 but can also be ordered via the part number 34431105.

In addition to the VARIPACK frequency inverters, the BEST interface converter can be used for many other BITZER electronic products such as for the CSV compressors, the compressor modules and the SE-i1.

Extension kit for pressure control

The extension kit with pressure transmitters allows you to control the evaporation temperature and condensing temperature.

Functions:

// Direct evaporation temperature control via compressor frequency
// Control of the condensing temperature by activating the condenser fans via 0 – 10 V signal
// Switching on a second compressor via relay

Properties:

// A variety of refrigerants are selectable

Extent of delivery:

// Extension module
  – Two digital inputs for activating set point 2 for evaporation and condensing temperature
  – Relay for activating the second compressor
// Precisely working and compact low and high pressure transmitters for refrigeration applications
  – Low pressure transmitter:
    Pressure range (abs): 0 – 13,8 bar,
    test pressure: >25 bar
  – High pressure transmitter:
    Pressure range (abs): 1 – 35,5 bar,
    test pressure: >50 bar
  – Bursting pressure: >100 bar
  – Permitted temperature range: -50 °C to 120 °C
  – Released for refrigerants of safety classes A1, A2, A2(L) and A3
// M12 connection cable for pressure transmitters with a cable length of 7,5 m in IP67

Technical data

Type	Weight	Rated output current	Power (at 400 V)		Decisive features		Compliances					
					C2[1] EMC filter	STO	CE	UKCA	UL[2]	cUL[2]	RCM	EAC
FMY+6-4	4.8 kg	5.8 A	2.2 kW	3 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FMY+10-4		9.5 A	4.0 kW	5 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FMY+14-4	5.1 kg	14 A	5.5 kW	7,5 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNY+18-4	7.7 kg	18 A	7.5 kW	10 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNY+24-4		24 A	11.0 kW	15 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNY+30-4		30 A	15.0 kW	20 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FOY+39-4	9.5 kg	39 A	18.5 kW	25 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FOY+46-4		46 A	22.0 kW	30 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPW+61-4	23 kg	61 A	30.0 kW	40 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPW+72-4		72 A	37.0 kW	50 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPW+90-4		90 A	45.0 kW	60 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FQW+110-4	55 kg	110 A	55.0 kW	75 HP	External	✓	✓	✓	✓	✓	✓	✓
FQW+150-4		150 A	75.0 kW	100 HP	External	✓	✓	✓	✓	✓	✓	✓
FQW+180-4		180 A	90.0 kW	150 HP	External	✓	✓	✓	✓	✓	✓	✓
FRW+202-4	89 kg	202 A	110.0 kW	175 HP	External	✓	✓	✓	✓	✓	✓	✓
FRW+240-4		240 A	132.0 kW	200 HP	External	✓	✓	✓	✓	✓	✓	✓
FRW+302-4		302 A	160.0 kW	250 HP	External	✓	✓	✓	✓	✓	✓	✓
FSW+370-4	132 kg	370 A	200.0 kW	300 HP	Integrated	✓	✓	✓	✓	✓	✓	
FSW+480-4		480 A	250.0 kW	400 HP	Integrated	✓	✓	✓	✓	✓	✓	

Technical data

Type	Weight	Rated output current	Power (at 400 V)		Decisive features		Compliances						
					C2[1] EMC filter	STO	CE	UKCA	UL[2]	cUL[2]	RCM	EAC
FMU+6-4	1.8 kg	5.8 A	2.2 kW	3 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FMU+10-4		9.5 A	4.0 kW	5 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNU+14-4	3.5 kg	14 A	5.5 kW	7,5 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNU+18-4		18 A	7.5 kW	10 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FNU+24-4		24 A	11.0 kW	15 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FOU+30-4	9.5 kg	30 A	15.0 kW	20 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FOU+39-4		39 A	18.5 kW	25 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FOU+46-4		46 A	22.0 kW	30 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPU+61-4	18.1 kg	61 A	30.0 kW	40 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPU+72-4		72 A	37.0 kW	50 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FPU+90-4		90 A	45.0 kW	60 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FQU+110-4	32 kg	110 A	55.0 kW	75 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FQU+150-4		150 A	75.0 kW	100 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FQU+180-4	43 kg	180 A	90.0 kW	150 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FQU+202-4		202 A	110.0 kW	175 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FSU+370-4	124.5 kg	370 A	200.0 kW	300 HP	Integrated	✓	✓	✓	✓	✓	✓	✓
FSU+480-4		480 A	250.0 kW	400 HP	Integrated	✓	✓	✓	✓	✓	✓	✓

[1] According to EN61800-3

[2] Only at switch cabinet mounting

Frequency inverter connection:
380 .. 480 V/3/50 Hz
380 .. 480 V/3/60 Hz

The VARIPACK frequency inverters comply with the EU Directive 2014/30/EU (electromagnetic compatibility, EMC).
In order to achieve the EMC class of the frequency inverters, the EMC notes in the operating instructions "CB-110" must be observed. Use a compressor with metal terminal box for correct installation of the shielded motor cable.

In networks with reactive current compensation systems, make sure that they contain line reactors.

Operation with IT systems (e.g. on ships) is possible on request with the IP20 types. In order to reach compatibility with this network type and the installed mains monitoring, the integrated EMC filters must be deactivated and special external filters must be used instead.

Operation with generators, emergency power generators and in combination with active filters only after consultation with BITZER.
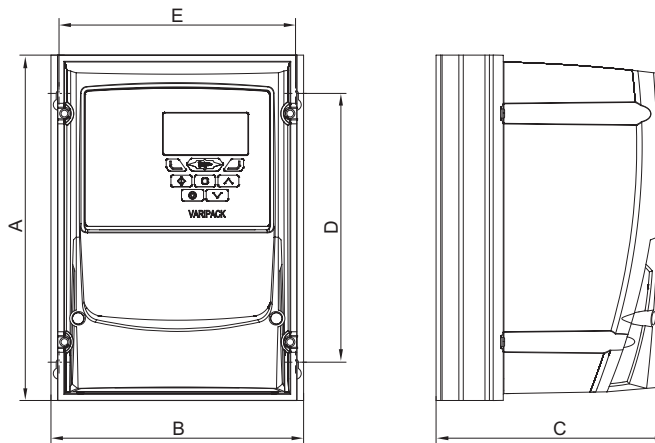
Dimensional drawings

IP20
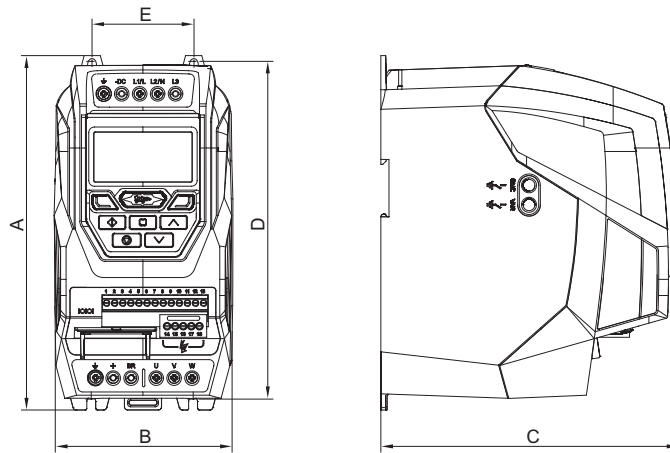
	A mm	B mm	C mm	D mm	E mm
FMU+6-4, FMU+10-4	221	110	185	209	63
FNU+14-4, FNU+18-4, FNU+24-4	261	131	205	247	80
FOU+30-4, FOU+39-4, FOU+46-4	418	172	240	400	125
FPU+61-4, FPU+72-4, FPU+90-4	486	233	260	460	175
FQU+110-4, FQU+150-4	614	286	320	578	200
FQU+180-4, FQU+202-4	726	330	320	680	225
FSU+370-4, FSU+480-4	974	444	423	924	320

IP66

	A mm	B mm	C mm	D mm	E mm
FMY+6-4, FMY+10-4	257	188	172	1200	176
FMY+14-4	257	188	196	200	176
FNY+18-4, FNY+24-4, FNY+30-4	310	211	225	252	198
FOY+39-4, FOY+46-4	360	240	260	300	227

Dimensional drawings

IP55
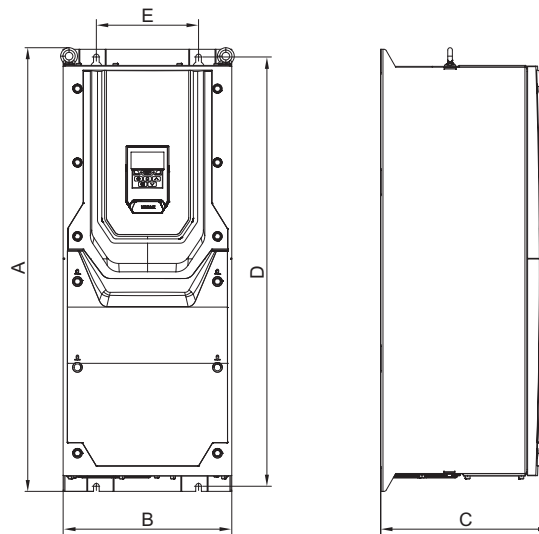
	A mm	B mm	C mm	D mm	E mm
FPW+61-4, FPW+72-4, FPW+90-4	540	235	270	520	175
FQW+110-4, FQW+150-4, FQW+180-4	865	330	330	840	200
FRW+202-4, FRW+240-4, FRW+302-4	1280	330	360	1255	200
FSW+370-4, FSW+480-4	1334	444	423	924	320

Notes

Notes