Application planning

6

Overview

The BaseUnits (BU) are classified according to different types. Every BaseUnit type is distinguished by characteristics that match certain I/O modules and motor starters (see the following table and graphics).

You recognize the BU type for an I/O module by the last two digits of an I/O module's article number.

The BU type onto which you can plug the respective I/O module is printed on the I/O modules. You can therefore read which BU type you need straight from the I/O module (see Factory labels (Page 171) (page 122)).

Example: On the output module DQ 16x24VDC/0.5A ST with article number 6ES7132-6BH01-0B**A0** the information "BU: A0" is printed. This means you can plug this I/O module into a BaseUnit of BU type "A0", which means any BaseUnit whose article number ends in "A0". I/O modules that are suitable for two BU types are labeled accordingly, for example "BU: A0, A1".

NOTE

You will find a complete module overview of the ET 200SP distributed I/O system and an overview of possibilities of combining BaseUnits and I/O modules /motor starters in the Product information for documentation of the ET 200SP distributed I/O system (https://support.industry.siemens.com/cs/de/de/view/73021864/en).

NOTE

Use of Ex modules

If you are using Ex I/O modules for the connection of intrinsically safe devices from Zone 0 or Zone 1 in the ET 200SP configuration, observe the information for plant planning in the System Manual ET 200SP HA Distributed I/O system / ET 200SP Modules for devices used in an explosion hazardous environment (https://support.industry.siemens.com/cs/ww/de/view/109795533/en).

Table 6-1 Selecting a suitable BaseUnit for interface modules

Select BaseUnit	Interface module (example)	Examples of suitable interface modules for BU types	
		Interface module (example)	BaseUnit
BU type **M0**	Interface module • 6ES7...**M0** • 24 V DC • 100 mm wide	IM 155-6 PN R1 (6ES7155-6AU00-0H**M0**)	BU (6ES7193-6BR00-0H**M0**)

Table 6-2 Selecting a suitable BaseUnit for I/O modules

Select BaseUnit	I/O module (example)	Examples of suitable I/O modules for BU types	
		I/O module (example)	BaseUnit
BU type **A0** See Digital, fail-safe, communication, technology or analog modules without temperature measurement (Page 84)	Digital, fail-safe, technology or communication module • 6ES7...**A0** • 24 V DC • 15 mm wide	DI 16×24VDC ST (6ES7131-6BH00-0B**A0**)	BU15-P16+A0+2D (6ES7193-6BP00-0D**A0**)
BU type **A1** See Analog modules with temperature measurement (Page 85)	Analog module **with** temperature measurement* • 6ES7...**A1** • 24 V DC • 15 mm wide	AI 4×RTD/TC 2-/3-/4-wire HF (6ES7134-6JD00-0C**A1**)	BU15-P16+A0+2D/T (6ES7193-6BP00-0D**A1**)
	Analog module **without** temperature measurement** • 6ES7...**A1** • 24 V DC • 15 mm wide	AI 4xU/I 2-wire ST (6ES7134-6HD00-0B**A1**)	
BU type **B0** (BU..B, dark-colored BaseUnit)	Digital output module with relay • 6ES7...**B0** • Up to 230 V AC • 20 mm wide	RQ 4×120VDC-230VAC/5A NO ST (6ES7132-6HD00-0B**B0**)	BU20-P12+A4+0B (6ES7193-6BP20-0B**B0**)
BU type **B1** (BU..B, dark-colored BaseUnit)	Digital modules • 6ES7...**B1** • Up to 230 V AC • 20 mm wide	DI 4×120..230VAC ST (6ES7131-6FD00-0B**B1**)	BU20-P12+A0+4B (6ES7193-6BP20-0B**B1**)
BU type **C0** (BU..D, light-colored BaseUnit)	Fail-safe power module • 6ES7...**C0** • 24 V DC • 20 mm wide CM AS-i Master ST/F-CM AS-i Safety ST • 6ES7...**C1** • Up to 30 V DC • 20 mm wide	CM AS-i Master ST (3RK7137-6SA00-0B**C1**)	BU20-P6+A2+4D (6ES7193-6BP20-0D**C0**)

* For compensation of the reference junction temperature for thermocouples. BU type A1 is required if you measure the reference junction temperature with an internal temperature sensor or if you need the additional 2×5 terminals.
If you use the internal reference junction temperature with BU type A1, ensure an even temperature distribution at the terminals. The specified accuracy of the utilized analog module is then adhered to. If necessary, you can increase the accuracy via user calibration.

** Analog modules **with and without** temperature measurement can also be plugged into BU type A0.

Select BaseUnit	I/O module (example)	Examples of suitable I/O modules for BU types	
		I/O module (example)	BaseUnit
BU type **C1** (BU..B, dark-colored BaseUnit)	F-CM AS-i Safety ST • 6ES7...**C1** • Up to 30 V DC • 20 mm wide	F-CM AS-i Safety ST (3RK7136-6SC00-0B**C1**)	BU20-P6+A2+4B (6ES7193-6BP20-0B**C1**)
BU type **D0**	AI Energy Meter • 6ES7...**D0** • Up to 400 V AC/ 480 V AC • 20 mm wide	AI Energy Meter 480VAC ST (6ES7134-6PA20-0B**D0**)	BU20-P12+A0+0B (6ES7193-6BP00-0B**D0**)
BU type **F0**	F-RQ 1×24VDC/24..230VAC/5A • 6ES7...**F0** • Up to 230 V AC • 20 mm wide	F-RQ 1×24VDC/24..230VAC/5A (6ES7136-6RA00-0B**F0**)	BU20-P8+A4+0B (6ES7193-6BP20-0B**F0**)
BU type **U0**	DQ 4×24...230VAC/2A HF • 6ES7...**U0** • Up to 400 V AC/480 V AC • 20 mm wide	DQ 4×24...230VAC/2A HF (6ES7132-6FD00-0C**U0**)	BU20-P16+A0+2D (6ES7193-6BP00-0B**U0**)

* For compensation of the reference junction temperature for thermocouples. BU type A1 is required if you measure the reference junction temperature with an internal temperature sensor or if you need the additional 2×5 terminals.
If you use the internal reference junction temperature with BU type A1, ensure an even temperature distribution at the terminals. The specified accuracy of the utilized analog module is then adhered to. If necessary, you can increase the accuracy via user calibration.

** Analog modules **with and without** temperature measurement can also be plugged into BU type A0.

Table 6-3 BaseUnit for motor starters

		Selecting the BaseUnit									
		BU-30--MS1	**BU-30--MS2**	**BU-30--MS3**	**BU-30--MS4**	**BU-30--MS5**	**BU-30--MS6**	**BU-30--MS7**	**BU-30--MS8**	**BU-30--MS9**	**BU-30--MS10**
24 V infeed		**x**		**x**							
500 V infeed		**x**	**x**			**x**		**x**	**x**		
(no routing of the F-DI signal possible)F-DI terminals						**x**	**x**				
F-DI infeed								**x**			**x**
F-DI routing									**x**	**x**	
Motor starters											
DS 0.1 - 0.4 A HF	3RK1308-0A-A00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*

* The F-DI terminals or F-DI infeed/routing have no function with this combination.

DS 0.3 - 1A HF	3RK1308-0A-B00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
DS 0.9 - 3A HF	3RK1308-0A-C00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
DS 2.8 - 9A HF	3RK1308-0A-D00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
DS 4.0 - 12A HF	3RK1308-0AE-00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
RS 0.1 - 0.4 A HF	3RK1308-0B-A00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
RS 0.3 - 1A HF	3RK1308-0BB-00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
RS 0.9 - 3A HF	3RK1308-0BC-00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
RS 2.8 - 9A HF	3RK1308-0B-D00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
RS 4.0 - 12A HF	3RK1308-0BE-00-0CP0	x	x	x	x	x*	x*	x*	x*	x*	x*
F-DS 0.1 - 0-.4 A HF	3RK1308-0C-A00-0CP0	x	x	x	x	x	x	x	x	x	x
F-DS 0.3 - 1A HF	3RK1308-0CB-00-0CP0	x	x	x	x	x	x	x	x	x	x
F-DS 0.9 - 3A HF	3RK1308-0C-C00-0CP0	x	x	x	x	x	x	x	x	x	x
F-DS 2.8 - 9A HF	3RK1308-0C-D00-0CP0	x	x	x	x	x	x	x	x	x	x
F-DS 4.0 - 12A HF	3RK1308-0CE-00-0CP0	x	x	x	x	x	x	x	x	x	x
F-RS 0.1 - 0.4 A HF	3RK1308-0D-A00-0CP0	x	x	x	x	x	x	x	x	x	x
F-RS 0.3 - 1A HF	3RK1308-0D-B00-0CP0	x	x	x	x	x	x	x	x	x	x
F-RS 0.9 - 3A HF	3RK1308-0D-C00-0CP0	x	x	x	x	x	x	x	x	x	x
F-RS 2.8 - 9A HF	3RK1308-0D-D00-0CP0	x	x	x	x	x	x	x	x	x	x
F-RS 4.0 - 12A HF	3RK1308-0D-E00-0CP0	x	x	x	x	x	x	x	x	x	x

* The F-DI terminals or F-DI infeed/routing have no function with this combination.

Additional information

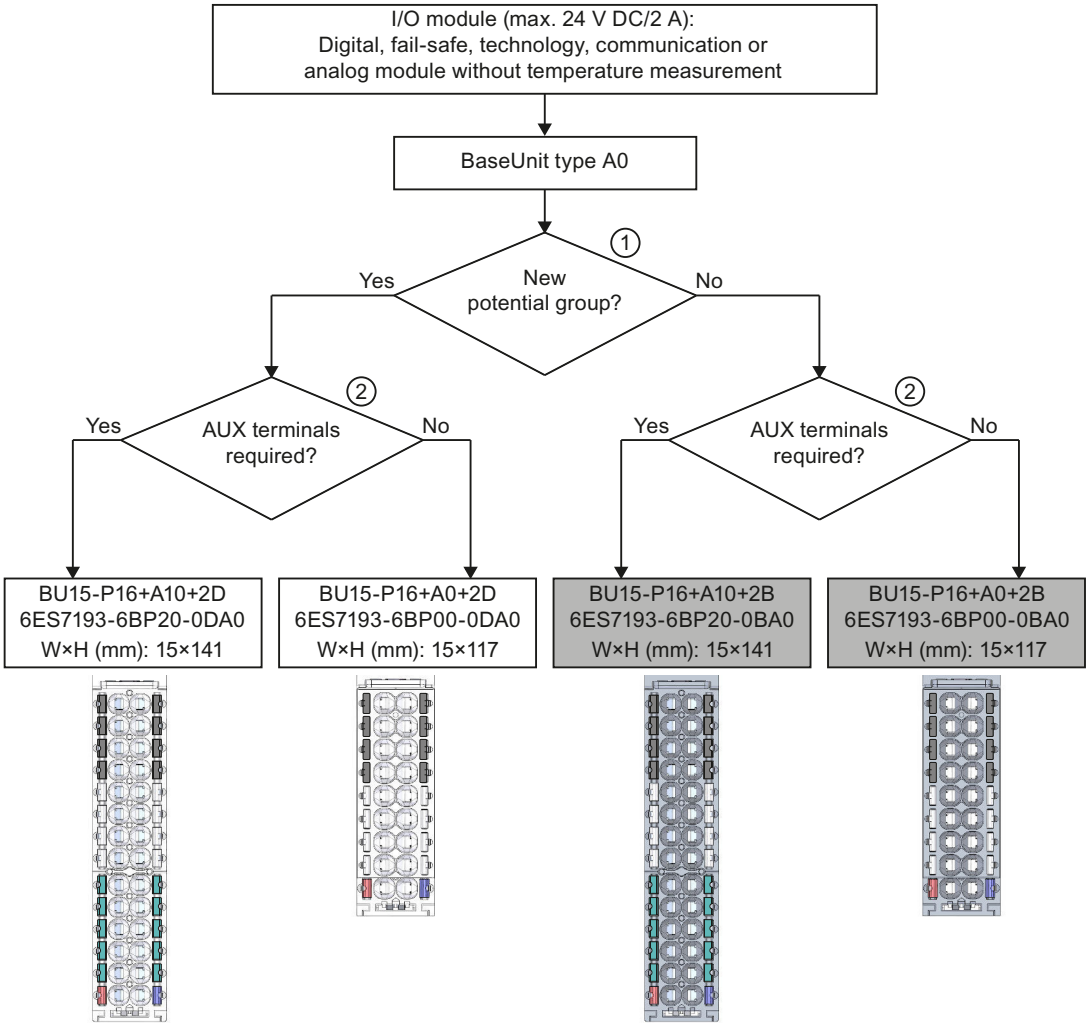
Additional information on the functional assignment of the terminals and on the associated BaseUnits can be found in one of the following manuals:

- Manual for the relevant I/O module (https://support.industry.siemens.com/cs/ww/en/ps/14039/man)
- Manual BaseUnits (https://support.industry.siemens.com/cs/ww/de/view/59753521/en)
- Motor starter (https://support.industry.siemens.com/cs/ww/en/view/109479973) manual

6.1 Selecting the BaseUnit for I/O modules

6.1.1 Digital, fail-safe, communication, technology or analog modules without temperature measurement

Selection of a suitable BaseUnit



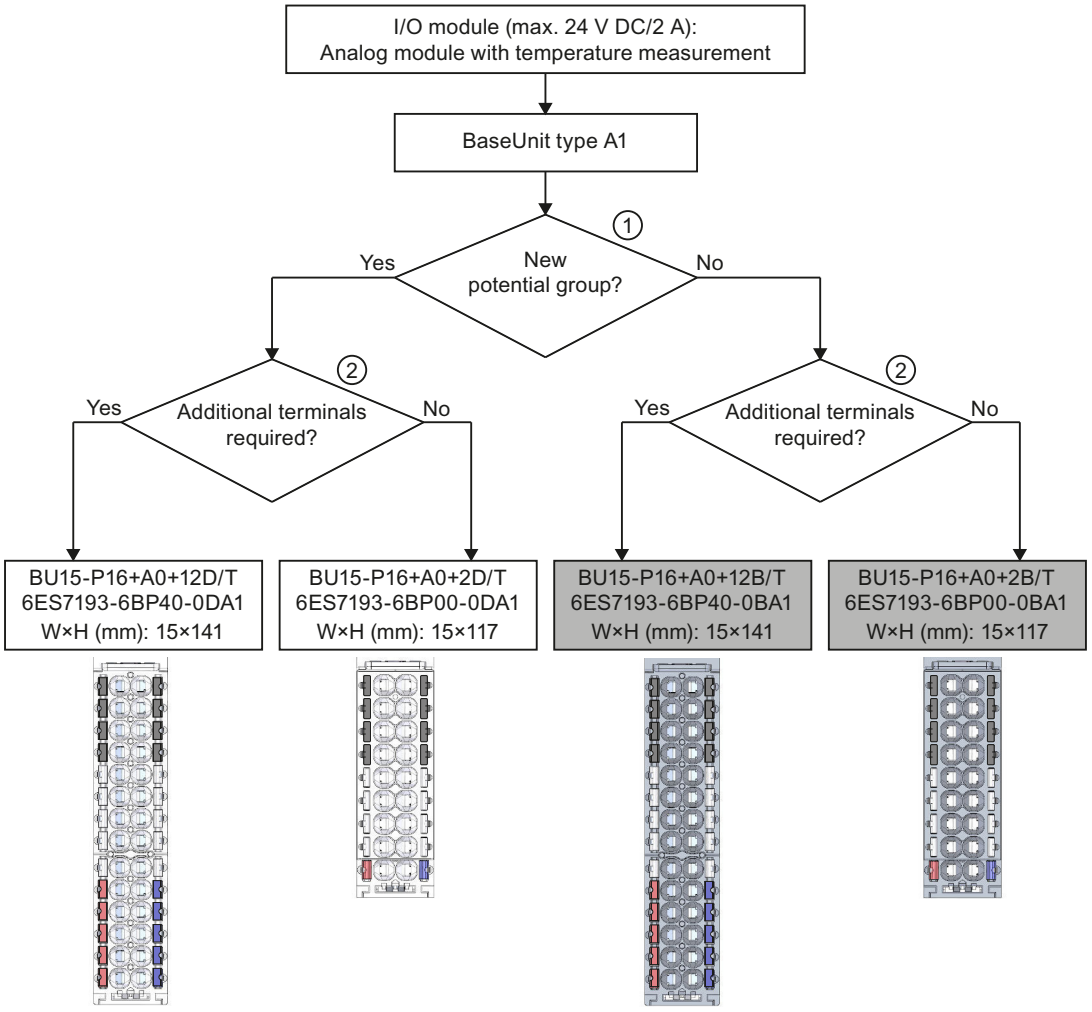
① Light-colored BaseUnit: Configuration of a new potential group, electrical isolation from adjacent module on the left. The first BaseUnit of the ET 200SP is usually a light-colored BaseUnit for feeding the supply voltage L+. A potential group opened with a light-colored BU type U0 must not contain any dark-colored BaseUnit of BU type A0 or A1.
Exception: If you insert, as the first I/O module, an AC I/O module, a AI Energy Meter 400VAC or a AI Energy Meter 480VAC, then the first BaseUnit in the ET 200SP configuration can be a dark-colored BaseUnit. The requirement is that you use a CPU or IM 155-6 (as of V3.0).
Dark-colored BaseUnit: Conduction of the internal power and AUX buses from the adjacent module on the left.

② AUX terminal: 10 internally bridged terminals for individual use up to 24 V DC/10 A or as protective conductors.
Example: Multiple cable connection for DI 8×24VDC ST

Figure 6-1 Digital, fail-safe, communication, technology or analog modules without temperature measurement

6.1.2 Analog modules with temperature measurement

Selection of a suitable BaseUnit



① Light-colored BaseUnit: Configuration of a new potential group, electrical isolation from adjacent module on the left. The first BaseUnit of the ET 200SP is usually a light -colored BaseUnit for feeding the supply voltage L+.
Dark-coloredBaseUnit: Continuation of the internal power and AUX buses from the adjacent module on the left.

② Additional terminals: 2×5 internally bridged terminals for individual use up to 24 V DC/2 A
Example: Sensor supply for AI 4×U/I 2-wire ST

Figure 6-2 Analog modules with temperature measurement

6.2 Selecting motor starters with a suitable BaseUnit

6.2.1 Selecting a BaseUnit for motor starters

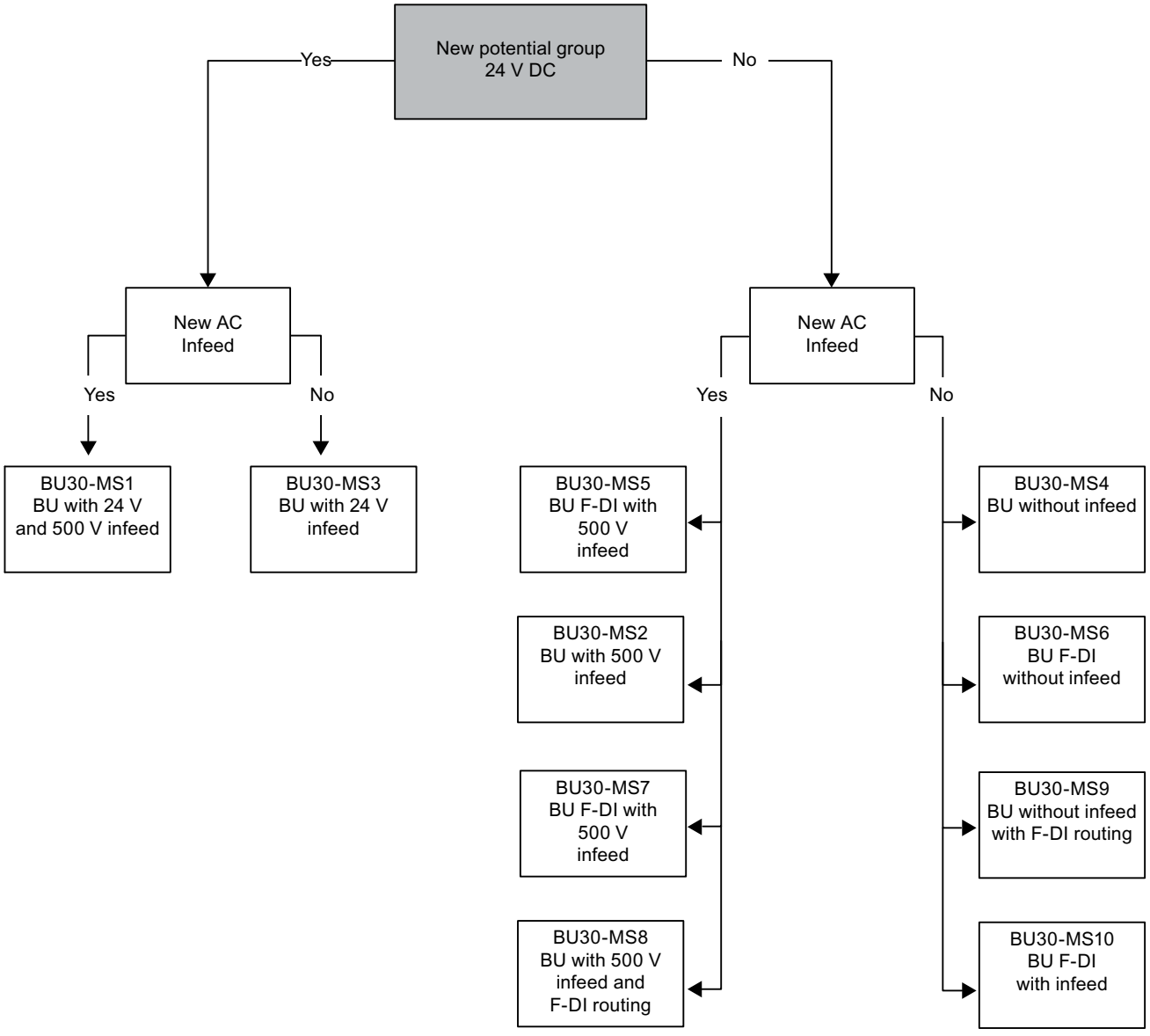
The motor starter BaseUnits "BU30-MS1", "BU30-MS2", "BU30-MS3" and "BU30-MS4" are compatible with all non-fail-safe motor starters. The motor starter BaseUnits "BU30-MS1", "BU30-MS2", "BU30-MS3", "BU30-MS4", "BU30-MS5", "BU30-MS6", "BU30-MS7", "BU30-MS8", "BU30-MS9" and "BU30-MS10" are compatible with all fail-safe motor starters. You will find an overview of available BaseUnits for motor starters here (Page 80). With the different BaseUnits, you can form different potential groups for the 24 V DC electronics supply (L+/M) and for the AC infeed.

Voltage range

The voltage range of the AC infeed is between 48 V AC and 500 V AC.

Selection criteria for the BaseUnit

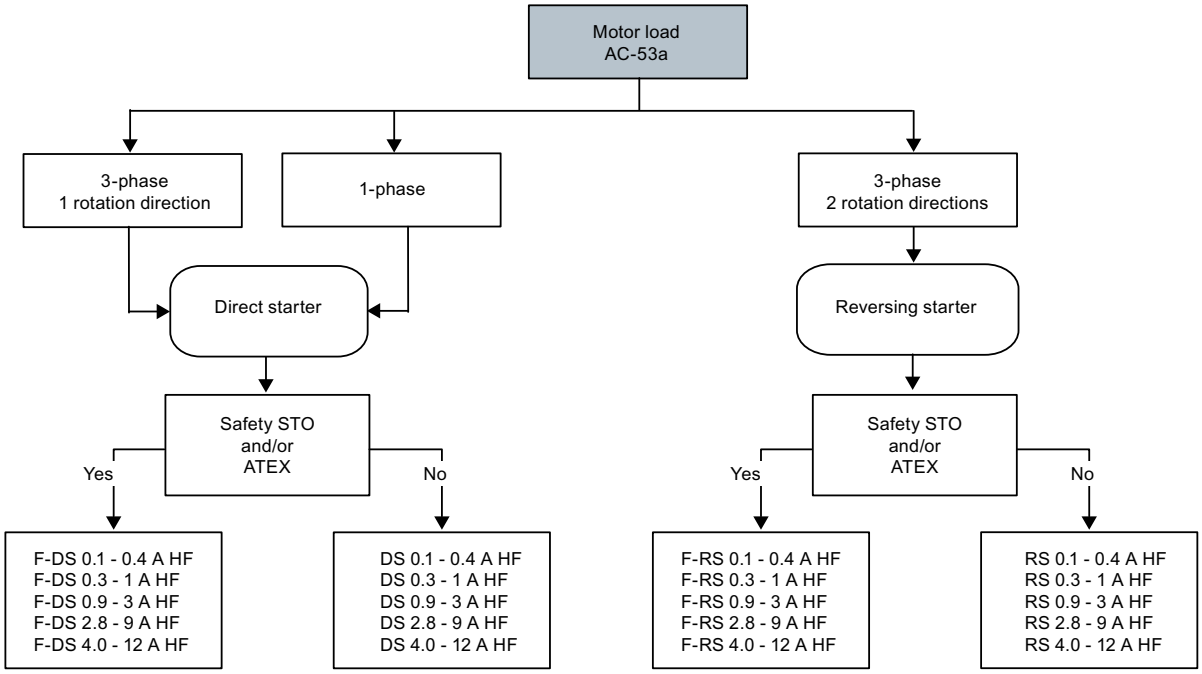
The figure below shows the criteria you use to select the appropriate BaseUnit:

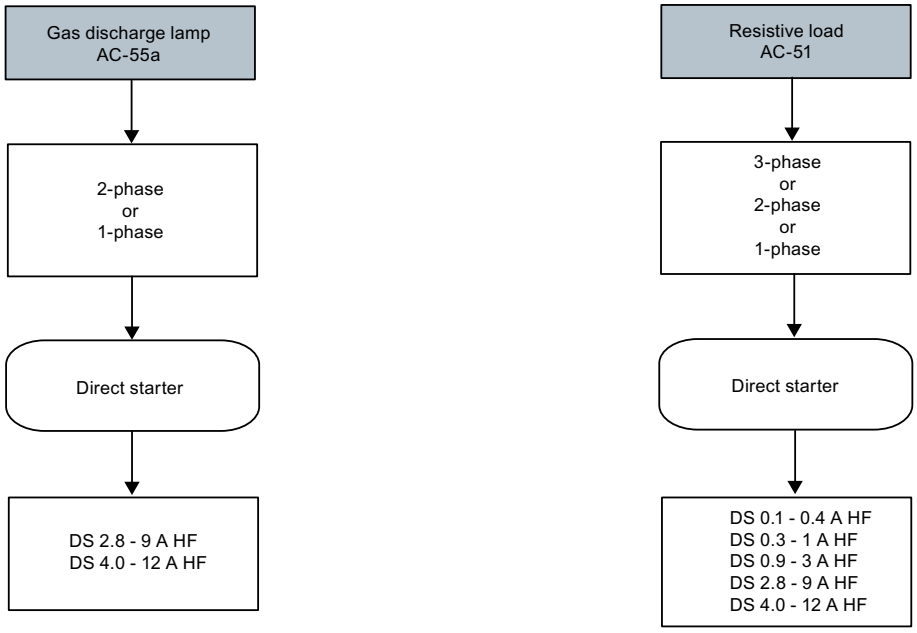


Form separate potential groups on the infeed bus for single-phase (L, N, PE) and three-phase (L1, L2, L3, PE) operation.

6.2.2 Selecting the motor starter

You select the suitable motor starter using the load type according to the following scheme:





6.2.3 Selecting accessories for motor starters

Observe the installation conditions of the station with ET 200SP motor starters. The figure below shows the criteria the station must meet: