



Technical Catalogue AC Drives



TECO V33/F33 2.0
0.55 - 3000 kW, 230 - 690 V

TECO V33 2.0 / High dynamics for demanding applications



The TECO V33, 2.0 AC drive optimizes your process and prevents damage and downtime. The combination of direct torque control, accurate speed control and efficient vector braking makes it the ideal solution for all dynamic applications, such as cranes, crushers, mills, mixers and centrifuges.

Main features

- Robust and certified IP54 metal construction as standard offers cost-efficient installation close to the application.
- All drive sizes are delivered with a built-in Category C3 EMC-filter as standard. C3 requirements are fulfilled with 80 m motor cable.
- Direct torque control reacts extremely quickly and eliminates disturbances due to abrupt load changes.
- Soft starts minimize start currents and full motor overload capacity is available from standstill.
- UL (UL 840) and marine (DNV) approved standard drive.
- Integrated vector braking ensures quick and controlled stops, increasing productivity and safety.
- Speed controlled fans assures less noise, a more even drive temperature and higher drive efficiency.
- Module fuses included as standard for sizes above 300 A at 480 V and above 210 A at 690 V.
- Detachable multilingual control panel included as standard. Following languages are supported in the control panel: English, Swedish, Dutch, German, French, Spanish, Russian, Italian, Czech and Turkish.
- Operation parameters can be set in your process units, for example m/sec, tons/h or cycles/min.
- Removable control panel with own memory means it is easy to transfer or copy settings.
- Liquid cooled version available for sizes above 90 A.



UL 840



GOST R



TECO V33, 2.0

Typical motor power at mains voltage 400 and 460 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)			Heavy duty (150%, 1 min. every 10 min.)			Frame size
		Power @ 400 V [kW]	Power @ 460 V [hp]	Rated current [A]	Power @ 400 V [kW]	Power @ 460 V [hp]	Rated current [A]	
JNVX48-003	3.8	0.75	1	2.5	0.55	1	2.0	B
JNVX48-004	6.0	1.5	2	4.0	1.1	1.5	3.2	
JNVX48-006	9.0	2.2	3	6.0	1.5	2	4.8	
JNVX48-008	11.3	3	3	7.5	2.2	3	6.0	
JNVX48-010	14.3	4	5	9.5	3	3	7.6	
JNVX48-013	19.5	5.5	7.5	13.0	4	5	10.4	
JNVX48-018	27.0	7.5	10	18.0	5.5	7.5	14.4	
JNVX48-026	39	11	15	26	7.5	10	21	C
JNVX48-031	46	15	20	31	11	15	25	
JNVX48-037	55	18.5	25	37	15	20	29.6	
VJNVX48-046	69	22	30	46	18.5	25	37	
JNVX48-061	92	30	40	61	22	30	49	D
JNVX48-074	111	37	50	74	30	40	59	
JNVX48-090	108	45	60	90	37	50	72	E
JNVX48-109	131	55	75	109	45	60	87	
JNVX48-146	175	75	100	146	55	75	117	
JNVX48-175	210	90	125	175	75	100	140	
JNVX48-210	252	110	150	210	90	125	168	F
JNVX48-228	300	110	200	228	90	150	182	
JNVX48-250	300	132	200	250	110	150	200	
JNVX48-300	360	160	250	300	132	200	240	G
JNVX48-375	450	200	300	375	160	250	300	
JNVX48-430	516	220	350	430	200	250	344	H
JNVX48-500	600	250	400	500	220	350	400	
JNVX48-600	720	315	500	600	250	400	480	I
JNVX48-650	780	355	550	650	315	400	520	
JNVX48-750	900	400	600	750	355	500	600	
JNVX48-860	1032	450	700	860	400	550	688	J
JNVX48-1000	1200	500	800	1000	450	650	800	
JNVX48-1200	1440	630	1000	1200	500	800	960	K
JNVX48-1500	1800	800	1250	1500	630	1000	1200	
Sizes 900 kW - 2000 kW available on request								

* Available for a limited time and as long as drive temperature permits. Rated data at 40 C ambient temperature

Note: calculate available 230 V motor power by multiplying the 400 V power value (kW) from table above with 0.575 or use motor rated current for drive selection. Example: JNVX48-046, 22 kW x 0.575 = 12.6 kW at 230 V

TECO V33, 2.0

Typical motor power at mains voltage 525 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)		Heavy duty (150%, 1 min. every 10 min.)		Frame size
		Power @ 525 V [kW]	Rated current [A]	Power @ 525 V [kW]	Rated current [A]	
JNVX52-003	3.8	1.1	2.5	1.1	2.0	B
JNVX52-004	6.0	2.2	4.0	1.5	3.2	
JNVX52-006	9.0	3	6.0	2.2	4.8	
JNVX52-008	11.3	4	7.5	3	6.0	
JNVX52-010	14.3	5.5	9.5	4	7.6	
JNVX52-013	19.5	7.5	13.0	5.5	10.4	
JNVX52-018	27.0	11	18.0	7.5	14.4	
JNVX52-026	39	15	26	11	21	C
JNVX52-031	46	18.5	31	15	25	
JNVX52-037	55	22	37	18.5	29.6	
JNVX52-046	69	30	46	22	37	
JNVX52-061	92	37	61	30	49	D
JNVX52-074	111	45	74	37	59	
JNVX69-090	108	55	90	45	72	F69
JNVX69-109	131	75	109	55	87	
JNVX69-146	175	90	146	75	117	
JNVX69-175	210	110	175	90	140	
JNVX69-210	252	132	210	110	168	H69
JNVX69-250	300	160	250	132	200	
JNVX69-300	360	200	300	160	240	
JNVX69-375	450	250	375	200	300	
JNVX69-430	516	300	430	250	344	I69
JNVX69-500	600	315	500	300	400	
JNVX69-600	720	400	600	315	480	J69
JNVX69-650	780	450	650	355	520	
JNVX69-750	900	500	750	400	600	K69
JNVX69-860	1032	560	860	450	688	
JNVX69-1000	1200	630	1000	500	800	
Sizes 710 kW - 2200 kW available on request						

* Available for a limited time and as long as drive temperature permits. Rated data at 40 °C ambient temperature.

TECO V33, 2.0

Typical motor power at mains voltage 575 and 690 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)			Heavy duty (150%, 1 min. every 10 min.)			Frame size
		Power @ 575 V [hp]	Power @ 690 V [kW]	Rated current [A]	Power @ 575 V [hp]	Power @ 690 V [kW]	Rated current [A]	
JNVX69-090	108	75	90	90	60	75	72	F69
JNVX69-109	131	100	110	109	75	90	87	
JNVX69-146	175	125	132	146	100	110	117	
JNVX69-175	210	150	160	175	125	132	140	
JNVX69-210	252	200	200	210	150	160	168	H69
JNVX69-250	300	250	250	250	200	200	200	
JNVX69-300	360	300	315	300	250	250	240	
JNVX69-375	450	350	355	375	300	315	300	
JNVX69-430	516	400	450	430	350	315	344	I69
JNVX69-500	600	500	500	500	400	355	400	
JNVX69-600	720	600	600	600	500	450	480	J69
JNVX69-650	780	650	630	650	550	500	520	
JNVX69-750	900	750	710	750	600	600	600	K69
JNVX69-860	1032	850	800	860	700	650	688	
JNVX69-900	1080	900	900	900	750	710	720	
JNVX69-1000	1200	1000	1000	1000	850	800	800	
Sizes 1100 kW - 3000 kW available on request								

* Available for a limited time and as long as drive temperature permits. Rated data at 40 °C ambient temperature



The answer to a range of challenges

Cranes

Challenge	TECO V33 solution	Value
Starting with a heavy load is difficult and risky. Can lead to hoist load dips or jerks causing swinging load in travel motions	Direct torque control, motor pre-magnetization and precise brake control gives instant yet soft start with heavy load.	Shortened cycle times and increased safety. Less stress on equipment reduced maintenance costs and down time
Unsynchronized travel motions of a rail-mounted crane causes noisy operation and stress on wheels.	Speed and position of wheels are fully synchronized. Crane rides parallel to the rail.	Less maintenance and downtime. Less noise improves working conditions.
Crane is driven slowly when returning empty or with a light load. Valuable time is lost.	Speed can be increased by operating the motor in the field weakening area.	Reduced cycle times and optimized operation
Hoisting and grabbing cannot be controlled independently. Stress on ropes and longer cycle times.	Hoisting and grabbing can be operated simultaneously. Grab can be opened/closed while being hoisted.	Reduced cycle times. Hoisting while closing grab puts less stress on ropes. Reducing maintenance and downtime.
Braking with heavy load is difficult and risky. Can lead to jerks causing swinging load.	Direct torque control and brake chopper smoothly reduce speed to zero before mechanical brake is activated.	Increased safety. Less stress on equipment reduces maintenance and downtime
Operator starts braking earlier than necessary to stop the crane at end position. Increases cycle times and can lead to jerky movements.	System automatically stops crane at end position. Operator can safely drive at full speed.	Reduced cycle times and increased safety.

Crushers

Challenge	TECO V33 solution	Value
High start currents require larger fuses and cables, or in mobile units larger generators. Causes stress on equipment and higher energy costs.	Speed control reduces start current. Same fuses can be used as those required for the normal motor current, or a smaller generator.	Lower investment and energy costs, extended equipment lifetime.
Abrupt load change or torque peak when starting heavily loaded crusher. Causes mechanical stress and false trips.	Direct torque control adjusts the torque to handle load changes and overcome initial peak loads.	Reliable operation without interruptions. Reduced mechanical stress and less downtime
Material that could cause damage gets into the crusher.	Load curve protection function quickly detects deviation. Warning is sent or safety stop activated.	Early warning allows preventive action before damage or breakdown.
Motor runs at same speed despite varying demand.	Motor speed is continuously adapted to the amount and size of rock. Speed of feeder is adapted to load variations.	Increased efficiency. Reduced maintenance cost.

Mixers

Challenge	TECO V33 solution	Value
High start currents require larger fuses and cables, Causes stress on equipment and higher energy costs.	Speed control reduces start current. Same fuses can be used as those required for the normal motor current,	Lower investment and energy costs, extended equipment lifetime.
Difficult to determine when mixing process is ready	Built-in shaft power monitor determines when viscosity is right.	Optimized operation and higher product quality.
Motor runs at same speed despite varying demand.	Speed is continuously adapted to viscosity level.	Reduced mixing time and improved product quality. Reduced maintenance costs.
Process inefficiency due to e.g. a damaged or broken blade. Energy wasted, mechanical stress and risk of process failure	Load curve protection function quickly detects deviation from normal load. Warning is sent or safety stop activated.	Preventive action before damage or breakdown. No energy is lost and downtime is reduced.

TECO F33, 2.0 / Secure the flow and save energy



The TECO F33, 2.0 AC drive is specially developed for regulating flow and pressure. It continuously adapts motor speed to the level required, minimizing energy consumption and wear. A unique monitoring functionality protects your process from damage and unplanned downtime. Typical applications are pumps, fans, compressors and blowers.

Main features

- Robust and certified IP54 metal construction as standard offers cost-efficient installation close to the application.
- All drive sizes are delivered with built-in Category C3 EMC-filter as standard. C3 requirements are fulfilled with 80 m motor cable.
- Soft starts minimize start currents and linear stops prevent water hammer.
- One TECO F33 can control up to seven units without external control systems.
- Energy saving function pauses the motor when it is not required to run to maintain pressure.
- Efficiency is increased by setting the pump to run at full speed at certain intervals to rinse out sludge.
- Speed controlled fans assures less noise, a more even drive temperature and higher efficiency.
- Module fuses included as standard for sizes above 300 A at 480 V and above 210 A at 690 V.
- Detachable multilingual control panel included as standard. Following languages are supported in the control panel: English, Swedish, Dutch, German, French, Spanish, Russian, Italian, Czech and Turkish.
- Operation parameters can be set in your process units, for example $\text{m}^3/\text{min.}$ and bar.
- Removable control panel with own memory means it is easy to transfer or copy settings.
- UL (UL 840) and marine (DNV) approved standard drive.
- Liquid cooled version available for sizes above 90 A.



UL 840



GOST R



TECO F33, 2.0

Typical motor power at mains voltage 400 and 460 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)			Heavy duty (150%, 1 min. every 10 min.)			Frame size
		Power @ 400 V [kW]	Power @ 460 V [hp]	Rated current [A]	Power @ 400 V [kW]	Power @ 460 V [hp]	Rated current [A]	
JNFX48-003	3.0	0.75	1	2.5	0.55	1	2.0	B
JNFX48-004	4.8	1.5	2	4.0	1.1	1.5	3.2	
JNFX48-006	7.2	2.2	3	6.0	1.5	2	4.8	
JNFX48-008	9.0	3	3	7.5	2.2	3	6.0	
JNFX48-010	11.4	4	5	9.5	3	3	7.6	
JNFX48-013	15.6	5.5	7.5	13.0	4	5	10.4	
JNFX48-018	21.6	7.5	10	18.0	5.5	7.5	14.4	
JNFX48-026	31	11	15	26	7.5	10	21	C
JNFX48-031	37	15	20	31	11	15	25	
JNFX48-037	44	18.5	25	37	15	20	29.6	
JNFX48-046	55	22	30	46	18.5	25	37	
JNFX48-061	73	30	40	61	22	30	49	D
JNFX48-074	89	37	50	74	30	40	59	
JNFX48-090	108	45	60	90	37	50	72	E
JNFX48-109	131	55	75	109	45	60	87	
JNFX48-146	175	75	100	146	55	75	117	
JNFX48-175	210	90	125	175	75	100	140	
JNFX48-210	252	110	150	210	90	125	168	F
JNFX48-228	300	110	200	228	90	150	182	
JNFX48-250	300	132	200	250	110	150	200	
JNFX48-300	360	160	250	300	132	200	240	G
JNFX48-375	450	200	300	375	160	250	300	
JNFX48-430	516	220	350	430	200	250	344	H
JNFX48-500	600	250	400	500	220	350	400	
JNFX48-600	720	315	500	600	250	400	480	I
JNFX48-650	780	355	550	650	315	400	520	
JNFX48-750	900	400	600	750	355	500	600	
JNFX48-860	1032	450	700	860	400	550	688	J
JNFX48-1000	1200	500	800	1000	450	650	800	
JNFX48-1200	1440	630	1000	1200	500	800	960	K
JNFX48-1500	1800	800	1250	1500	630	1000	1200	
Sizes 900 - 2000 kW available on request								

* Available for a limited time and as long as drive temperature permits. Rated data at 40 °C ambient temperature.

Note: calculate available 230 V motor power by multiplying the 400 V power value (kW) from table above with 0.575 or use motor rated current for drive selection. Example: JNFX48-046, 22 kW x 0.575 = 12.6 kW at 230 V

TECO F33, 2.0

Typical motor power at mains voltage 525 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)		Heavy duty (150%, 1 min. every 10 min.)		Frame size
		Power @ 525 V [kW]	Rated current [A]	Power @ 525 V [kW]	Rated current [A]	
JNFX52-003	3.0	1.1	2.5	1.1	2.0	B
JNFX52-004	4.8	2.2	4.0	1.5	3.2	
JNFX52-006	7.2	3	6.0	2.2	4.8	
JNFX52-008	9.0	4	7.5	3	6.0	
JNFX52-010	11.4	5.5	9.5	4	7.6	
JNFX52-013	15.6	7.5	13.0	5.5	10.4	
JNFX52-018	21.6	11	18.0	7.5	14.4	
JNFX52-019	22	11	18	7.5	14.4	C
JNFX52-026	31	15	26	11	21	
JNFX52-031	37	18.5	31	15	25	
JNFX52-037	44	22	37	18.5	29.6	
JNFX52-046	55	30	46	22	37	
JNFX52-061	73	37	61	30	49	D
JNFX52-074	89	45	74	37	59	
JNFX69-090	108	55	90	45	72	F69
JNFX69-109	131	75	109	55	87	
JNFX69-146	175	90	146	75	117	
JNFX69-175	210	110	175	90	140	
JNFX69-210	252	132	210	110	168	H69
JNFX69-250	300	160	250	132	200	
JNFX69-300	360	200	300	160	240	
JNFX69-375	450	250	375	200	300	
JNFX69-430	516	300	430	250	344	I69
JNFX69-500	600	315	500	300	400	
JNFX69-600	720	400	600	315	480	J69
JNFX69-650	780	450	650	355	520	
JNFX69-750	900	500	750	400	600	K69
JNFX69-860	1032	560	860	450	688	
JNFX69-1000	1200	630	1000	500	800	
Sizes 710 - 2200 kW available on request						

* Available for a limited time and as long as drive temperature permits. Rated data at 40 °C ambient temperature.

TECO F33 2.0

Typical motor power at mains voltage 575 and 690 V

Model	Max. output current [A]*	Normal duty (120%, 1 min. every 10 min.)			Heavy duty (150%, 1 min. every 10 min.)			Frame size
		Power @ 575 V [hp]	Power @ 690 V [kW]	Rated current [A]	Power @ 575 V [hp]	Power @ 690 V [kW]	Rated current [A]	
JNFX69-090	108	75	90	90	60	75	72	F69
JNFX69-109	131	100	110	109	75	90	87	
JNFX69-146	175	125	132	146	100	110	117	
JNFX69-175	210	150	160	175	125	132	140	
JNFX69-210	252	200	200	210	150	160	168	H69
JNFX69-250	300	250	250	250	200	200	200	
JNFX69-300	360	300	315	300	250	250	240	
JNFX69-375	450	350	355	375	300	315	300	
JNFX69-430	516	400	450	430	350	315	344	I69
JNFX69-500	600	500	500	500	400	355	400	J69
JNFX69-600	720	600	600	600	500	450	480	
JNFX69-650	780	650	630	650	550	500	520	K69
JNFX69-750	900	750	710	750	600	600	600	
JNFX69-860	1032	850	800	860	700	650	688	
JNFX69-900	1080	900	900	900	750	710	720	
JNFX69-1000	1200	1000	1000	1000	850	800	800	

Sizes 1100 - 3000 kW available on request

* Available for a limited time and as long as drive temperature permits. Rated data at 40 °C ambient temperature.



The answer to a range of challenges

Common to Pumps / Fans / Compressors & Blowers

Challenge	TECO F33 solution	Value
High start currents require larger fuses and cables. Causing stress on equipment and higher energy costs	Speed control reduces start current. Same fuses can be used as those required for the normal motor current.	Lower investment and energy costs. Extended equipment lifetime
Motor runs at same speed despite varying demands in pressure and flow or when no air is compressed	PID function continuously adapts speed to required level. Sleep function can be activated when the motor does not need to run.	Optimized energy consumption and increased efficiency. Reduced maintenance costs. Quicker set-up.
Process inefficiency due to e.g. A blocked pipe, a valve not fully opened or a worn impeller. A blocked filter, a damper not fully opened or a broken belt. The compressor idling	Load curve protection function quickly detects deviation from normal load. Warning is sent or safety stop activated.	Optimized operation. Preventive action before damage. No energy is lost and downtime is reduced.

Pumps

Challenge	TECO F33 solution	Value
Sludge buildup on impeller when pump operates at low speed or on prolonged standby. Reduces pump efficiency	Automatic pump rinsing: Pump can be set to run at full speed for a period of time before returning to normal operation.	Higher process efficiency and reduced maintenance costs.
Prolonged Dry-running, cavitation and over heating damage the pump causing downtime	Load curve protection function detects deviation. Sends warning or activates safety stop	Preventive action before damage. Extended equipment lifetime and reduced downtime
Water hammer damages the pump when stopped. Mechanical stress on pipes, valves, gaskets and seals.	Smooth linear stops protect the equipment. Eliminates need for costly motorized valves.	Reduced maintenance costs and less downtime. Extended equipment lifetime. Lower installation costs.

Fans

Challenge	TECO F33 solution	Value
Draught causes turned off fan to rotate the wrong way. Starting causes high current peaks and mechanical stress. Can result in blown fuses and breakdown.	Spin start ensures that the motor is picked up at its present speed and direction, gradually slowed to zero speed and then started in the right direction.	Reduced cycle times, extended equipment lifetime and less downtime.
Regulating pressure/flow with dampers causes high energy consumption and equipment wear.	Automatic regulation of pressure/flow with motor speed gives a more exact control.	Optimized energy consumption and minimized impact on equipment.

Compressors

Challenge	TECO F33 solution	Value
Compressor is damaged when cooling agent enters the compressor screw.	Overload situation is quickly detected and safety can be activated to avoid breakdown.	Extended equipment lifetime, reduced maintenance costs and downtime
Pressure is higher than needed causing leaks, stress on the equipment and excessive air use.	Load curve protection function detects deviation. Warning is sent or safety stop activated.	Preventive action before damage or breakdown. No energy is lost and downtime is reduced.

Blowers

Challenge	TECO F33 solution	Value
Difficult to compensate for pressure fluctuations. Energy wasted and risk of production stop.	PID function continuously adapts pressure to the level required	Reliable operation and no energy wasted. Always keeps the required pressure.

General specifications for TECO V33/F33, 2.0

General

Mains voltage: *	JNVX/JNFX48 JNVX/JNFX52 JNVX/JNFX69	230-480 V** +10 %/-15 % (-10 % at 230 V) 440-525 V**+10 %/-15 % 500-690 V** +10 %/-15 %
Mains frequency		45 to 65 Hz
Input total power factor		0.95
Output voltage		0–Mains supply voltage:
Output frequency		0–400 Hz
Output switching frequency		3 kHz (FDU adjustable 1.5-6 kHz)
Efficiency at nominal load		97 % for models 003 to 018 98 % for models 026 to 1500

* Available for both grounded and isolated supply (TN and IT nets).

** Nominal voltage selected with parameter.

Dimensions, weights and cooling air flow

The table below gives an overview of the dimensions, weights and requirements for air flow if mounted in cabinet. The models 300 to 1500

consist of 2, 3, 4 or 6 paralleled power modules (PEBB-s) built into a standard enclosure.

Models	Frame size	Dim. H x W x D [mm] IP20	Dim. H x W x D [mm] IP54	Weight IP20/IP54 [kg]	Air flow [m ³ /hour]
003 to 018	B	–	350(416) x 203 x 200	–/12.5	75
026 to 046	C	–	440(512) x 178 x 292	–/24	026-031=120, 037-046=170
061 to 074	D	-	545(590) x 220 x 295	- /32	175
90 to 109	E	–	950 x 285 x 314	–/56	510
146 to 175	E	–	950 x 285 x 314	–/60	510
210 to 250	F	–	950 x 345 x 314	–/74	800
300 to 375	G (2xE)	1036 x 500 x 390	2250 x 600 x 600	140/350	1020
430 to 500	H (2xF)	1036 x 500 x 450	2250 x 600 x 600	170/380	1600
600 to 750	I (3xF)	1036 x 730 x 450	2250 x 900 x 600	248/506	2400
860 to 1000	J (2xH)	1036 x 1100 x 450	2250 x 1200 x 600	340/697	3200
1200 to 1500	K (2xI)	1036 x 1560 x 450	2250 x 1800 x 600	496/987	4800

Models	Frame size	Dim. H x W x D [mm] IP20	Dim. H x W x D [mm] IP54	Weight IP20/IP54 [kg]	Air flow [m ³ /hour]
90 to 175	F69	–	1090 x 345 x 314	–/77	800
210 to 375	H69 (2xF69)	1176 x 500 x 450	2250 x 600 x 600	176/399	1600
430 to 500	I69 (3xF69)	1176 x 730 x 450	2250 x 900 x 600	257/563	2400
600 to 650	J69 (2xH69)	1176 x 1100 x 450	2250 x 1200 x 600	352/773	3200
750 to 1000	K69 (2xI69)	1176 x 1560 x 450	2250 x 1800 x 600	514/1100	4800

Environmental conditions

Parameter	Normal operation
Nominal ambient temperature	0°C–40°C
Atmospheric pressure	86–106 kPa
Relative humidity, non-condensing	0–90 %
Contamination, according to IEC 60721-3-3	No electrically conductive dust allowed. Cooling air must be clean and free from corrosive materials. Chemical gases, class 3C2 (coated boards 3C3). Solid particles, class 3S2.
Vibrations	According to IEC 60068-2-6, Sinusoidal vibrations: 10<f<57 Hz, 0.075 mm, 57<f<150 Hz, 1g Size B, C & D: IEC 60721-3-3 3M4 (2 - 9 Hz, 3.0mm and 9 - 20Hz, acc. 1g (10m/s ²))
Altitude	0–1000 m 480V AC drives, with derating 1%/100 m of rated current up to 4000 m 690V AC drives, with derating 1%/100 m of rated current up to 2000 m Coated boards required for 2000 - 4000m.

Parameter	Storage condition
Temperature	-20 to +60 °C
Atmospheric pressure	86 –106 kPa
Relative humidity, non-condensing	0 – 90 %

Operation at higher temperatures

Most Teco AC drives are designed for operation at maximum of 40 °C ambient temperature.

However, for most models, it is possible to use the AC drive at higher temperatures with little loss in performance.

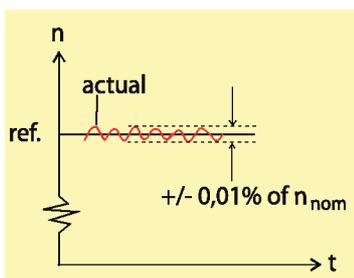
Table 1 shows ambient temperatures as well as derating for higher temperatures.

Table 1 Ambient temperature and derating 400–690 V types

Model	IP20		IP54	
	Max temp.	Derating: possible	Max temp.	Derating: possible
JNVX-JNFX**-003 to JNVX-JNFX**-074	–	–	40°C	-2.5 %/°C to max +10°C (50 °C)
JNVX-JNFX48-090 to JNVX-JNFX48-250 JNVX-JNFX69-090 to JNVX-JNFX69-175	–	–	40°C	-2.5 %/°C to max +5°C (45 °C)
JNVX-JNFX48-300 to JNVX-JNFX48-1500 JNVX-JNFX69-210 to JNVX-JNFX69-1000	40°C	-2.5 %/ ° C to max +5 ° C (45 ° C)	40°C	-2.5 %/ ° C to max +5 ° C (45 ° C)

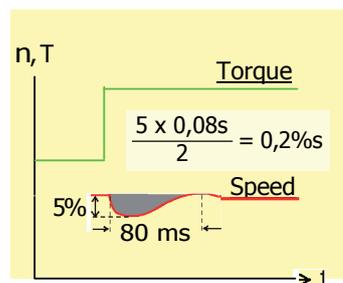
Control performance for TECO V33, 2.0 (Speed)

Speed control static accuracy (linearity):



Closed loop = 0.01 % of n_{nom}.
Open loop = 0.1 % of n_{nom}.

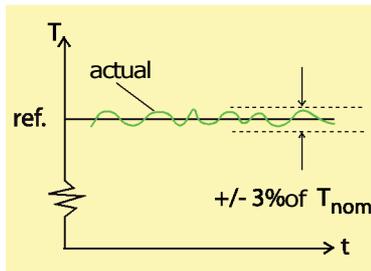
Speed Control dynamic accuracy (impact drop):



Closed loop = 0.2 %sec (100 % load step)

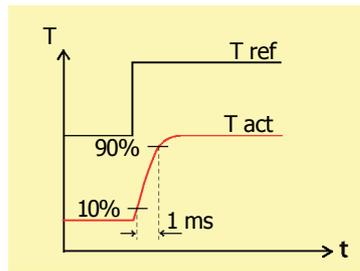
Open loop = 0.4 %sec (100 % load step)

Control performance for TECO V33, 2.0 (Torque)



Torque control static accuracy (linearity):

Closed loop: <3 % of T_{nom}
 Open loop: <3 % for speeds 10 - 100% of rated and <10 % at zero speed (% of n_{nom})



Torque control dynamic accuracy:

Closed & open loop : 100 % torque
 step rise time = 1 ms.

Control performance for TECO F33, 2.0 (V/Hz):

Speed control accuracy :
 approx. 1% of n_{nom} (slip frequency).

Torque accuracy:
 approx. 5 % of T_{nom}
 (20% - 100% speed).

Basic I/O Data

Control signal inputs: Analogue (differential), 4 channels	
Analogue voltage/current Max. input voltage Input impedance Resolution Hardware accuracy Non-linearity	0-±10 V/0-20 mA via software setting +30 V 20kΩ (voltage) 250Ω (current) 11 bits + sign 0.5 % type + 1 1/2 LSB fsd 1 1/2 LSB
Digital: 8 channels	
Input voltage Max. input voltage Input impedance Signal delay	High>9 VDC Low<4 VDC +30 VDC <3.3 VDC: 4.7 kΩ, >3.3 VDC: 3.6kΩ ≤8 ms
Control signal outputs: Analogue, 2 channels	
Output voltage/current Max. output voltage Short-circuit current (∞) Output impedance Resolution Maximum load impedance for current Hardware accuracy Offset Non-linearity	0-10 V/0-20 mA via switch +15 V @5 mA cont. +15 mA (voltage) +140 mA (current) 10Ω (voltage) 10 bit 500Ω 1.9 % type fsd (voltage), 2.4 % type fsd (current) 3 LSB 2 LSB
Digital, 2 channels	
Output voltage Short-circuit current(∞)	High>20 VDC @50 mA, >23 VDC open Low<1 VDC @50 mA 100 mA max (together with +24 VDC)
Relays, 3 pcs	
Contacts	0.1 – 2 A/U _{max} 250 VAC or 42 V _{DC}
Reference voltages	
+10VD -10VDC +24VDC	+10 VDC @10 mA short-circuit current +30 mA max -10 VDC @10 mA +24 VDC short-circuit current +100 mA max (together with Digital Outputs)

See “User interface data” on page 15 for connection data and default settings.

Photo gallery



VFX/FDU48/52: Model 003 - 018 (B)



VFX/FDU48/52: Model 026 - 046 (C)



VFX/FDU48/52: Model 061 - 074 (D)



JNVX/JNFX48: Model 090 – 175(E)



JNVX/JNFX48: Model 210 – 250 (F)
JNVX/JNFX 69: Model 090 – 175 (F69)



JNVX/JNFX: Model 600 – 750 (I) IP20 (module)



VFX/FDU48: Model 300 - 500 (G and H)
VFX/FDU69: Model 210 - 375 (H69)



VFX/FDU48: Model 600 - 750 (I)
VFX/FDU69: Model 430 - 500 (I69)

Fuses, cable dimensions and glands according IEC ratings

Use mains fuses of type gL/gG conforming to IEC 269 or circuit breaker with similar characteristics. Check the equipment first before installing the glands. In due time only metric glands will be used.

Max. fuse = maximum fuse value that still protects the AC drive and upholds warranty.

NOTE: The dimensions of fuse and cable cross-section are dependent on the application and must be determined in accordance with local regulations.

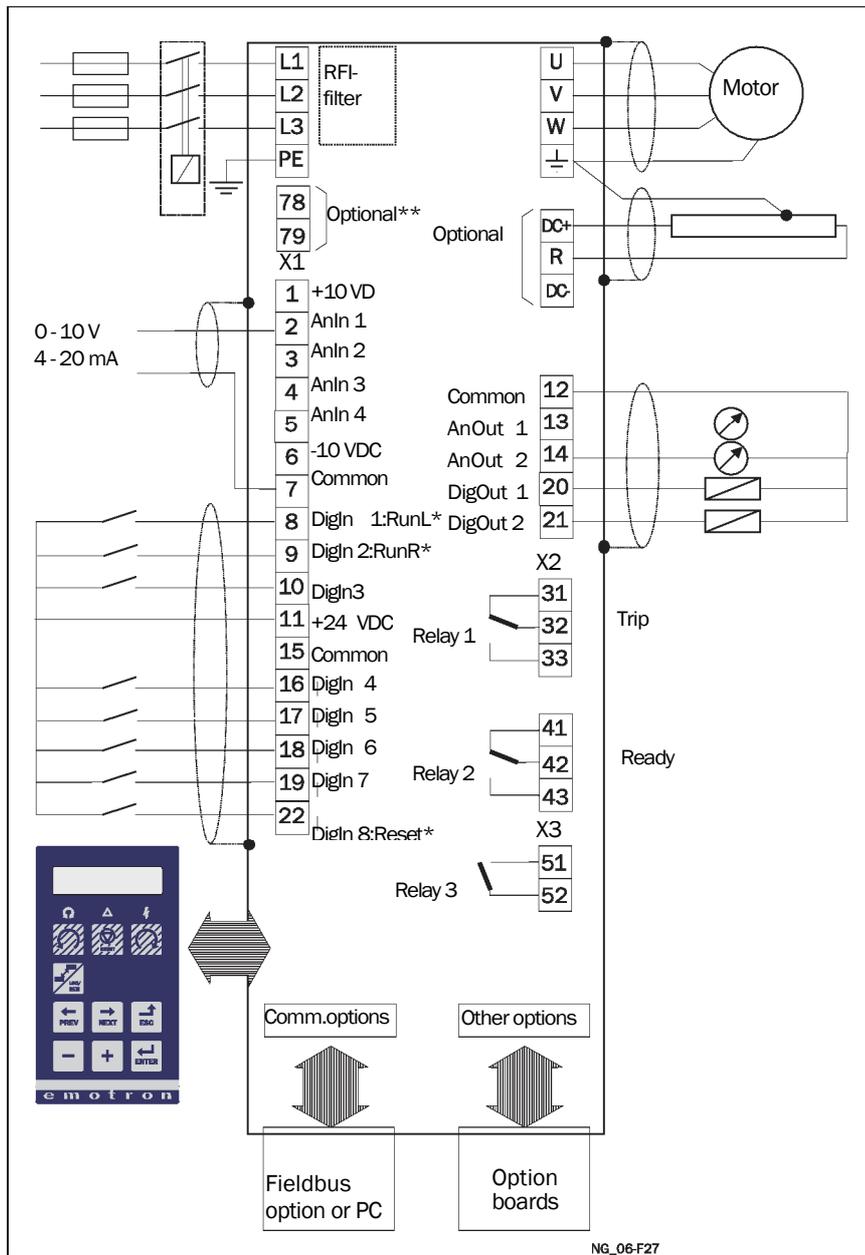
NOTE: The dimensions of the power terminals used in models 300 to 1500 can differ depending on customer specification.

Model	Nominal input current [A]	Maximum value fuse [A]	Maximum cable cross section range supported [mm ²]	Clamping range glands [mm]			
			Mains and motor	Mains	Motor		
JNVX/JNFX48-003	2.2	4	0.5 - 10	M32 opening M20 +reducer (6-12)			
JNVX/JNFX48-004	3.5	4		M32 (12-20)	M32 opening M25+reducer (10-14)		
JVX/JNFX48-006	5.2	6			M32 (16-25)	M32 (13-18)	
JVX/JNFX48-008	6.9	8		M32 (15-21)		M32 (13 - 18)	
JNVX/JNFX48-010	8.7	10				M40 (19-28)	M40 (18 - 25)
JNVX/JNFX48-013	11.3	16	2.5-16	M50 (27-35)	M40 (19-28)		
JNVX/JNFX48-018	15.6	20					
JNVX/JNFX**-026	22	25	1 - 35 stranded wire	M50 (27-35)	M40 (19-28)		
JNVX/JNFX**-031	26	35					
JNVX/JNFX**-037	31	35	1 - 50 solid wire	M50 (27-35)	M40 (19-28)		
JNVX/JNFX**-046	38	50					
JNVX/JNFX**-061	52	63	16-95	JNVXJNFX48: Ø17-42 cable flexible lead through or M50 opening.	JNVXJNFX69: Ø23-55 Cable flexible lead through M63 opening.		
JNVX/JNFX**-074	64	80					
JNVX/JNFX**-090	78	100	35-150	JNVXJNFX48: Ø17-42 cable flexible lead through or M50 opening.	JNVXJNFX69: Ø23-55 Cable flexible lead through M63 opening.		
JNVX/JNFX**-109	94	100					
JNVX/JNFX**-146	126	160	VFX/FDU48: 35-240	Ø23-55 cable flexible lead through or M63 opening.	Ø23-55 cable flexible lead through or M63 opening.		
JNVX/JNFX**-175	152	160					
JNVX/JNFX**-210	182	200	VFX/FDU69: 35-150	-	-		
JNVX/JNFX**-228	197	250					
JNVX/JNFX**-250	216	250	JNVX/JNFX48: (2x) 35-240	-	-		
JNVX/JNFX**-300	260	300					
JNVX/JNFX**-375	324	355	JNVX/JNFX69: (2x) 35-150	-	-		
JNVX/JNFX**-430	372	400	JNVX/JNFX48: (2x) 35-240				
JNVX/JNFX**-500	432	500	JNVX/JNFX69: (3x) 35-150	-	-		
JNVX/JNFX**-600	520	630	JNVX/JNFX48: (3x) 35-240				
JNVX/JNFX**-650	562	630	JNVX/JNFX69: (4x) 35-150	-	-		
JNVX/JNFX**-750	648	710	JNVX/JNFX48: (3x) 35-240				
JNVX/JNFX**-860	744	800	JNVX/JNFX69: (6x) 35-150	-	-		
JNVX/JNFX**-900	795	900					
JNVX/JNFX**-1000	864	1000	JNVX/JNFX48: (4x) 35-240	-	-		
JNVX/JNFX**-1200	1037	1250	JNVX/JNFX69: (6x) 35-150				
JNVX/JNFX**-1500	1296	1500	JNVX/JNFX48: (6x) 35-240	-	-		

Fuses and cable dimensions according NEMA ratings

Model	Input current [Arms]	Mains input fuses		Cable cross section range supported
		UL Class J TD (A)	Ferraz-Shawmut type	Mains and motor
JNVX/JNFX48-003	2.2	6	AJT6	AWG 20 - AWG 6
JNVX/JNFX48-004	3.5	6	AJT6	
JNVX/JNFX48-006	5.2	6	AJT6	
JNVX/JNFX48-008	6.9	10	AJT10	
JNVX/JNFX48-010	8.7	10	AJT10	
JNVX/JNFX48-013	11.3	15	AJT15	
JNVX/JNFX48-018	16	20	AJT20	AWG 12 – AWG 4
JNVX/JNFX48-026	22	25	AJT25	
JNVX/JNFX48-031	26	30	AJT30	
JNVX/JNFX48-037	31	35	AJT35	
JNVX/JNFX48-046	38	45	AJT45	
JNVX/JNFX48-061	52	60	AJT60	AWG 12 - AWG 4
JNVX/JNFX48-074	65	80	AJT80	AWG 10- AWG 0
JNVX/JNFX48-090	78	100	AJT100	AWG 4 – AWG 3/0
JNVX/JNFX48-109	94	110	AJT110	
JNVX/JNFX48-146	126	150	AJT150	AWG 1 – AWG 3/0 AWG 4/0 – 300 kcmil
JNVX/JNFX48-175	152	175	AJT175	
JNVX/JNFX48-210	182	200	AJT200	AWG 3/0 – 400 kcmil
JNVX/JNFX48-228	197	250	AJT250	
JNVX/JNFX48-250	216	250	AJT250	
JNVX/JNFX48-300	260	300	AJT300	2 x AWG 4/0 – 2 x 300 kcmil
JNVX/JNFX48-375	324	350	AJT350	
JNVX/JNFX48-430	372	400	AJT400	2 x AWG 3/0 – 2 x 400 kcmil
JNVX/JNFX48-500	432	500	AJT500	
JNVX/JNFX48-600	520	600	AJT600	3 x AWG 4/0 – 3 x 300 kcmil
JNVX/JNFX48-650	562	600	AJT600	
JNVX/JNFX48-750	648	700	A4BQ700	
JNVX/JNFX48-860	744	800	A4BQ800	4 x AWG 4/0 – 4 x 300 kcmil
JNVX/JNFX48-1000	864	1000	A4BQ1000	
JNVX/JNFX48-1200	1037	1200	A4BQ1200	6 x AWG 4/0 – 6 x 300 kcmil
JNVX/JNFX48-1500	1296	1500	A4BQ1500	

User interface data



X1	Name:	Function (Default):
1	+10 V	+10VDC Supply voltage
2	AnIn1	Speed reference
3	AnIn2	Not used
4	AnIn3	Not used
5	AnIn4	Not used
6	-10 V	-10VDC Supply voltage
7	Common	Signal ground
8	DigIn 1	RunL
9	DigIn 2	RunR
10	DigIn 3	Not used
11	+24 V	+24VDC Supply voltage
12	Common	Signal ground
13	AnOut 1	Min speed to max speed
14	AnOut 2	0 to max torque
15	Common	Signal ground
16	DigIn 4	Not used
17	DigIn 5	Not used
18	DigIn 6	Not used
19	DigIn 7	Not used
20	DigOut 1	Ready
21	DigOut 2	Brake/No trip
22	DigIn 8	Reset
X2		
31	N/C 1	Relay 1 output=Trip Active when the AC drive is in a TRIP condition. N/C is opened when the relay is active (valid for all relays) N/O is closed when the relay is active (valid for all relays)
32	COM 1	
33	N/O 1	
41	N/C 2	Relay 2 Output=Ready Active when the AC drive is ready to start
42	COM 2	
43	N/O 2	
X3		
51	COM 3	Relay 3 Output=Not used
52	N/O 3	

* = Default selection

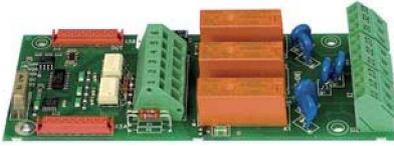
** = Optional terminals X1: 78 - 79 for connection of Motor-PTC on sizes B, C and D.

All inputs and outputs are programmable.

Standard options for TECO F33/V33 2.0

Support for 3 option boards plus 1 communication option.

I/O board



3 extra relay outputs (230 VAC/5 A NO/NC). 3 extra 24 V /3.2 k Ω (AC or DC) differential digital inputs, all programmable. Inputs providing 50 Vac,dc isolation between channels.

Maximum 3 I/O boards can be built -in per AC drive.

Part no. 01-3876-01

Encoder board



Differential encoder input suitable for 5 V (TTL) or 24 V (HTL) incremental encoders, range 5-16384 pulses/revolution. Inputs min 9 k Ω . Max frequency = 100 kHz. For single

ended or differential type of encoders (A/B, A'/B'). Selectable encoder supply voltage output 5 V_{DC} or 24 V_{DC}.

Part no. 01-3876-03

PTC/PT100 board



1 PTC isolated input conforming to DIN 44081/44082.

Part no. 01-3876-08

Max 6 PTC thermistors can be connected in series to PTC input. Also including 3 PT100 inputs, 2/3/4-wire, conforming to EN 60751.

CRIO board (VFX)

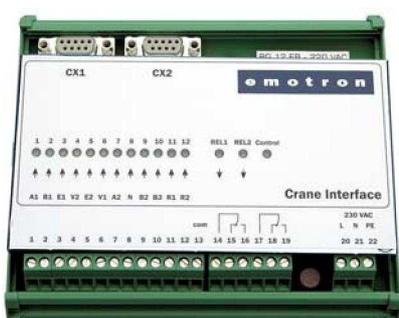


Crane option board to control hoist or travel motions. Inputs for joystick control: supporting 4-step, motor potentiometer or analog reference joystick types. Inputs for slow down and end limits switches (2+2). All 12 digital inputs 24 V/5 k Ω (8 - 24V) DC.

2 relay outputs 250 V/2AAC, for mechanical brake and load deviation protection. Load dependent field weakening operation of hoists also supported.

Part no. 01-3876-07

Crane interface (VFX)



Isolated I/O interface for control signals between (existing) crane controls and crane option board (CRIO).

- HxWxD = 125 x 150 x 50 mm

Part no. 590059 (230 VAC)
590060 (24 V_{DC})

- Available for 230 V/27 k Ω (120 - 250V) AC or 24 V /2.7 k Ω (15 - 36 V) DC input signals.
- LED indications for all inputs and outputs.
- For DIN-rail mounting.

Fieldbus - Profibus



Fieldbus option module for Profibus DP or DP V1 communication. Use 9-pin D-sub connector.

Baud rates: 9.6 kbits/s - 12 Mbits/s supported.

Typical drive response time = 10 ms

(not including any fieldbus delays).

Part no. 01-3876-05

Fieldbus - DeviceNet



Fieldbus option module for DeviceNet communication. Baud rates: 125 - 500 kbits/s supported.

Typical drive response time = 10 ms (not including any fieldbus delays).

Part no. 01-3876-06

Ethernet - Modbus/TCP



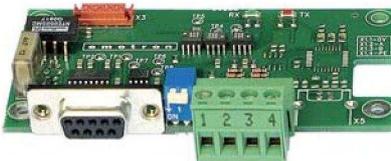
Industrial Ethernet option module for Modbus/TCP protocol. RJ45 type connector.

Baud rates: 10 or 100 Mbits/s supported.

Typical drive response time = 10 ms (not including any fieldbus delays).

Part no. 01-3876-09

RS232/RS485 isolated



Isolated RS232/RS485 serial communication board. For Modbus/RTU communication protocol.

Baud rates: 2400 - 38400 bits/s supported.

Typical drive response time = 10 ms (not including any fieldbus delays).

Part no. 01-3876-04

Coated boards



All drive boards are also available as coated, recommended e.g. for sewer pump applications (chlorine gases) or installations with occasional high humidity (if machine room installation or tropical climate). IEC60721-3-3 gases class 3C3, solid particles class 3S2.

Control panel kit, incl. blank panel



External control panel IP54 suitable for mounting on a cabinet door. This option is to be used in combination with a AC drive module ordered with a built-in control panel.

Part no. 01-3957-01

Control panel kit, incl. control panel



External control panel IP54 suitable for mounting on a panel door. This option is to be used in combination with a AC drive module ordered with a blank control panel.

Part no. 01-3957-00

Handheld Control Panel 2.0



Handheld Control Panel - HCP 2.0 is a complete control panel, easy to connect to the AC drive, for temporary use during e.g. commissioning and service.

The HCP has full functionality. It is possible to set parameters, view actual values and fault logger. It is

also possible to copy parameter data from one AC drive to the HCP and then load this data to other AC drives.

Part no. 01-5039-00
Complete with cable.

Glands for frame sizes B, C and D



Gland kits are available for size B, C and size D. Metal EMC glands are used for motor and brake resistor cables.

Part No	Current	Frame size
01-4601-21	3 - 6A (M16 - M20)	B
01-4601-22	8 - 10A (M16 - M25)	
01-4601-23	13 - 18A (M16 - M32)	
01-4399-01	26 - 31A (M12 - M32)	C
01-4399-00	37 - 46A (M12 - M40)	
01-4833-00	61 - 74A (M20 - M50)	D

EmoSoftCom



Connect a PC with a standard RS232 cable under the control panel on the front.

EmoSoftCom PC software makes it possible to perform signal recordings and save/load parameter backup data, for example during service & maintenance.

Factory mounted options for TECO F33/V33, 2.0

Brake chopper

All Teco V33/F33 drives can be fitted with an optional built-in brake chopper. Brake choppers are rated for continuous braking at drive rated load. This option cannot be after mounted. The brake resistor must be mounted outside the AC drive (see page 23 for Brake resistor option).

DC+/DC- connection

DC+/DC- terminals for external connection of the Teco V33/F33 drive DC link. This option is required if using the Overshoot clamp.

Standby power supply



Built-in standby power supply board. To be connected to external 24 V AC/DC supply voltage. If the main power is switched off, the control board, control panel and the connected options, for example

fieldbus communication, will continue to operate.

Part no: 01-3954-00

Safe stop



Safe stop for size B, C and D (uses 1 of the 3 option positions)



Safe stop for size E and up

Extra built-in inputs and outputs for emergency stop circuit conforming with the norms EN-IEC 62061:2005 SIL2 and EN-ISO 13849-1:2006.

Blank control panel



Blank panel instead of control panel (to maintain IP54). Indication LED's for Power, Run and Trip available.

PTC



Factory mounted, isolated motor PTC input conforming to DIN44081/44082, available with size B, C and D. Use PTC/PT100 option board if additional inputs are needed.

EMC filter class C2



EMC filter according to EN61800-3:2004 class C2 - 1st environment restricted distribution. For sizes B, C and D. Integrated inside the drive module.

Note: EMC filter acc. to class C3 - 2nd environment included as standard in all drive units.

Extended options for TECO F33/V33 2.0

Extended EMC filter 90-650A



EMC filter according to EN61800-3:2004 class C2 - 1st environment, restricted distribution. From frame size E. Rated voltage=480 V, 50/60 Hz. Max. 40 °C ambient temperature.

Drive model	Filter type	Dimensions HxWxD [mm]	Weight [kg]	Enclosure
JNVX/JNFX48-090	3F480-100.230	325x150x107	7.1	IP20 ¹
JNVX/JNFX48-109	3F480-125.230	345x175x127	10	IP20 ¹
JNVX/JNFX48-146	3F480-150.230	375x175x135	10	IP20 ¹
JNVX/JNFX48-175	3F480-180.230	490x170x158	13.5	IP00 ²
JNVX/JNFX48-210	3F480-220.230	490x170x158	13.5	IP00 ²
JNVX/JNFX48-250	3F480-250.230	490x230x158	18.2	IP00 ²
JNVX/JNFX48-300	3F480300.230	490x230x158	18.2	IP00 ²
JNVX/JNFX48-375	3F480-400.230	580x230x158	22	IP00 ²
JNVX/JNFX48-430	3F480-500.230	630x345x158	37.5	IP00 ²
JNVX/JNFX48-500	3F480-500.230	630x345x158	37.5	IP00 ²
JNVX/JNFX48-600	3F480-600.230	660x375x187	42	IP00 ²
JNVX/JNFX48-650	3F480-700.230	865x345x157	42	IP00 ²

1=Screw terminal (protected)

2=Busbar terminals

Output choke (dU/dt)



Output chokes (supplied separately) are recommended above app. 100 m cable length for all single drives. Consult your supplier in case of paralleled drives. Due to the switching of output voltage, high capacitive peak currents will run through the parasitic capacitances between the phases and to earth. Screened cables have more parasitic capacitances. Output chokes should be installed as close as possible to the drive output. Output chokes also

limits voltage peaks at motor winding.

Rated voltage = 800 V, IP00 units. Suitable for up to IP23 cabinet installation. Max. 40°C ambient temperature.

Parallel connection of output coils possible if higher current rating required (e.g. one filter per PEBB). For further advice when to use output options see filter selection guide, page 24

Nominal current (I _N) A/Phase	L [mH]	Weight [kg]	Dimensions HxWxD [mm]	Part no.
2.8	1.5	0.6	60x78x95	473160 00
4.4	1	0.6	60x78x95	473161 00
6.6	0.65	0.6	60x78x95	473162 00
11	0.4	1	65x96x105	473163 00
14.3	0.3	1	65x96x105	473164 00
18.2	0.25	1.2	74x96x105	473165 00
26.4	0.175	1.2	74x96x105	473166 00
32	0.15	1.7	84x125x140	473167 00
65	0.1	4	105x155x205	473168 00
90	0.1	8.4	120x90x235	473169 00
146	0.05	10.2	140x190x260	473170 00
175	0.05	13.4	160x210x180	473171 00
275	0.032	18.4	170x230x200	473172 00
320	0.025	18.9	170x230x200	473173 00
410	0.021	22.6	180x240x210	473174 00

Overshoot clamp



Together with the output choke, the overshoot clamp restricts the voltage and the dV/dt on the motor winding. For rated voltages 380 - 690 V. H x W x D = 250 x 145 x 95 mm

Part no. 052163 (size B–F)
052220 (size G–K)

NOTE: AC drive, frame sizes B up to F(69), must be ordered including the option DC+/DC--connections.

Sine wave filter



Only for use with F33 drives. Rated voltage= 400 V \pm 25 %, 50/60 Hz (690 V on request).

Max. 40 °C ambient temperature.

IP20= with enclosure and screw terminals.

IP00=no enclosure and busbar connections.

Voltage drop approximately 25 V at rated current, 50 Hz.

Overload: 110 % for 5 min, 150 % for 2 min or 200 % for 30 s.

For further information see filter selection guide, page 24

Filter type 3AFS400-	Protection class	Power [kW]	Nom. current (In) A/Phase	Power loss [W]	Weight [kg]	Dimensions HxWxD [mm]
002.5	IP20	0.75	2.5	75	5	190x165x160
004	IP20	1.5	4	90	5	190x165x160
007	IP20	2.2	7	125	7	250x162x162
010	IP20	4	10	165	9	250x162x162
013	IP20	5.5	13	190	12	250x162x162
016	IP20	7.5	16	220	13	300x210x180
025	IP20	11	25	250	18	300x250x210
035	IP20	15	35	275	25	300x270x235
010	IP00	4	10	165	9	195x200x115
013	IP00	5.5	13	190	12	225x200x115
016	IP00	7.5	16	220	13	225x240x135
025	IP00	11	25	250	18	270x250x160
035	IP00	15	35	275	25	270x250x160
050	IP00	22	50	320	45	280x300x250
063	IP00	30	63	550	49	270x300x370
080	IP00	37	80	380	65	324x360x320
100	IP00	45	100	530	65	324x360x320
125	IP00	55	125	650	85	335x390x320
150	IP00	75	150	580	119	440x480x340
180	IP00	90	180	760	131	440x480x340
250	IP00	132	250	600	135	420x420x390
300	IP00	160	300	1000	140	420x420x390
400	IP00	200	400	1100	320	440x500x400
500	IP00	250	500	1250	335	470x500x400

Common mode filter



Common mode filters are mainly used to reduce common mode currents in motors (typically used with motors >size 280). Common mode filters can prevent damage of motor bearings. All three motor phases are to be routed through common mode filter rings. These filter can also be used to reduce EMC emissions in supply cables.

Part no. 052213

(size G - K69 require one Common mode filter per PEBB).

Brake resistors



VPR= Compact – IP54 with 0.75 m shielded cable.

BEGT= Steel grid resistor – IP20 or IP23 with thermo contact.

For dynamic braking by connection to the drive brake chopper output (optional).

Type	Resistor power [kW] in % duty cycle					Dimensions H x W x D [mm]	
	100	60	40	25	6	IP54	
VPR 200-__R	0.2		0.47	0.74	3.6	200x60x31	–
VPR 300-__R	0.3		0.705	1.11	5.4	250x60x31	–
VPR 400-__R	0.4		0.94	1.48	7.2	301x60x31	–
VPR 500-__R	0.5		1.175	1.85	9.0	370x60x31	–
DEGT1VPR1000S_R-S	1		2.0	3.7	13.0	542x98x170	–
						IP20	IP23
BEGT 13#05-__R	2.5	3.25	4.25	6.25	21.0	301x483x326	500x483x326
BEGT 13#08-__R	4.0	5.2	6.8	10.0	34.0	301x483x326	500x483x326
BEGT 13#10-__R	5.0	6.5	8.5	12.5	42.5	301x483x326	500x483x326
BEGT 14#15-__R	7.5	9.8	12.7	18.7	64.0	301x483x426	500x483x426
BEGT 15#20-__R	10.0	13.0	17.0	25.0	85.0	301x483x526	500x483x526
BEGT 17#30-__R	15.0	19.5	25.5	37.5	127.0	301x483x740	500x483x740
BEGT 25#40-__R	20.0	26.0	34.0	50.0	170.0	601x484x526	800x484x526
BEGT 27#60-__R	30.0	39.0	51.0	75.0	255.0	601x484x736	800x484x736
BEGT 37#90-__R	40.0	52.0	68.0	100.0	340.0	1021x484x736	1181x484x736
BEGT 47#120-__R	50.0	65.0	85.0	125.0	425.0	1321x483x736	301x483x736
2xBEGT 27#60-__R	60.0	78.0	102.0	150.0	510.0	2x(601x484x736)	2x(800x484x736)
2xBEGT 37#78-__R	70.0	91.0	119.0	175.0	600.0	2x(1021x484x736)	2x(1181x484x736)
2xBEGT 37#90-__R	80.0	104.0	136.0	200.0	680.0	2x(1021x484x736)	2x(1181x484x736)
2xBEGT 47#120-__R	100.0	130.0	170.0	250.0	850.0	2x(1321x483x736)	2x(1481x483x736)

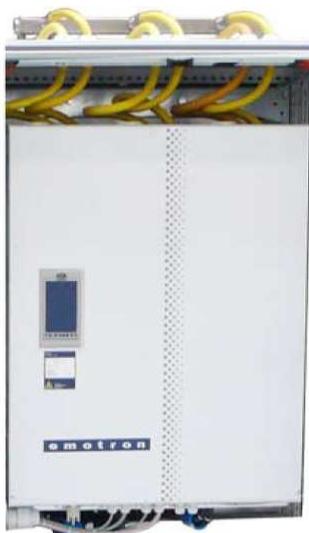
#=2: IP20, example BEGT 13205

#=4: IP23, example BEGT 13405

__R: resistance in ohm, example 26R=26 ohm

__R_: resistance in ohm, example 6R5=6.5 ohm

Liquid cooling



Drive modules in frame sizes E - K and F69 – K69 are available in a liquid cooled versions. These units are designed for connection to a liquid cooling system, normally a heat exchanger of liquid – liquid or liquid - air type. Heat exchanger is not part of the liquid cooling option. Drive units with parallel power modules (frame size G – K69) are delivered with a dividing unit for connection of the cooling system. The drive units are equipped with rubber hoses with leak-proof quick couplings.

Filter selection guide

Phenomenon	Filters	Common mode filter	Output choke	Output choke & overshoot clamp	Sine wave filter	All-pole sine wave filter
Common mode currents		Effective	Limited effect	Limited effect	Effective	Very effective
Bearing currents		Effective				Very effective
Voltage spikes U-V-W			Limited effect	Very effective	Very effective	Very effective
Voltage spikes U-PE			Limited effect	Effective	Limited effect	Very effective
dU/dt			Effective	Effective	Very effective	Very effective
Minimize motor audible noise			Limited effect	Limited effect	Effective	Effective
EMC conducted emission		Limited effective	Limited effect	Limited effect	Effective	Very effective

Recommendations with the different supply voltages up to and including 480 V

Situation	Filters	Common mode filter	Output choke	Output choke & overshoot clamp	Sine wave filter	All-pole sine wave filter
Not rated, delicate or difficult positioned motors		X			X	
Motor in frame size >280		X				
IEC 60034-17 motor			X			
IEC 60034-25 Curve A motor	Cable lengths 0-100m**					
	Cable lengths 100-200m		X			
	Cable lengths 200-500m				X	
Dynamic use with frequently raised DC voltage (braking)				X		
Unshielded cables *						X

X = advised solution for this setup

Recommendations with the different supply voltages from 500 V - 690 V

Situation	Filters	Common mode filter	Output choke	Output choke & overshoot clamp	Sine wave filter	All-pole sine wave filter
Not rated, delicate or difficult positioned motors		X			X	
Motor in frame size >280		X				
3 kV isolation windings **						
IEC 60034-25 Curve B motor	Cable lengths 0-100m**					
	Cable lengths 100-200m			X		
	Cable lengths 200-500m				X	
Dynamic use with frequently raised DC voltage (braking)				X		
Unshielded cables *						X

X = advised solution for this setup

Remarks

Cable lengths should always be as short as possible.

The table is based on correct EMC wiring with shielded cable and proper EMC installation.

For powers below 7.5 kW and long motor cables please contact Teco.

Voltage drop over the complete system must be less than 10% of the main supply.

Sine wave filters are only for use with Teco F33 range of drives.

* Conducted interference limits on unshielded motor - lines according to EN61800-3, table 16.

** No marks in a row, means that there is no need to take precautions.



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