TIBCON
ENERJİ TEKNOLOJİLERİ

www.tibcon.com.tr

INNOVATIVE SOLUTIONS,
SUSTAINABLE FUTURE

2025
CATALOG

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Who Are We?

Founded in 2013 with the aim of offering innovative solutions to improve energy quality, Tibcon Energy Technologies has rapidly become one of the leading companies in the sector through the innovative solutions it provides for compensation systems and energy efficiency.
With a customer-oriented approach, strong technical infrastructure, and high-performance products, Tibcon Energy serves a wide customer network through over 2,500 sales points across Turkey.
Closely following developments in the sector and adopting a continuous innovation mindset, Tibcon Energy not only provides products but also offers engineering solutions and project support, creating added value for its customers.
To Our Customers
With our expert, experienced, and dynamic team in energy management and efficiency, we offer fast, reliable, and economical solutions in many sectors where energy is a strategic and critical factor.

Main sectors we serve:
-Industrial facilities
-Commercial centers and shopping malls
-Hotels and accommodation facilities
-Hospitals and healthcare institutions
-Universities and educational institutions
-Industrial production facilities
-Agricultural irrigation systems
-Control panels and automation systems
-As Tibcon Energy, we consider customer satisfaction as our primary principle and continue to provide the best service with our strong stock structure, widespread distribution network, and superior product quality.

Our Core Values
Quality: We create difference with high-quality products and service standards.
Reliability: We offer sustainable and reliable solutions to our customers.
Responsibility: We act sensitively towards the environment and society.
Continuous Development: We constantly lead the sector with innovative and efficient solutions.
Goal Orientation: We ensure maximum efficiency through strategic goal-oriented approaches.
Teamwork: Our team works in harmony to provide the best service to our customers.
Efficiency and Innovation: We focus on efficiency and innovation to ensure effective energy use.
As Tibcon Energy, we will continue to offer sustainable, innovative, and reliable solutions by staying true to our core values

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TIBCON
ENERGY TECHNOLOGIES

CONTENTS

TIBCON LOW VOLTAGE POWER CAPACITORS

GENERAL FEATURES

TIBCON POWER CAPACITORS

In industrial facilities with inductive loads such as transformers, electric motors, and fluorescent lamps, power capacitors are used to balance reactive effects and to remain within the specified reactive power limits. When these capacitors are designed in stages, they can generate reactive power based on the varying reactive power demands of the system. This allows the user to produce the required reactive power instead of drawing it from the grid. As a result, transmission and distribution lines are relieved of unnecessary loads, enabling them to supply more load, while voltage drops and losses within the facility are reduced. This function is carried out by reactive power control relays, which switch capacitors in and out of the circuit through contactors or semiconductor switching elements, meeting the facility's reactive power needs and ensuring that reactive power ratios stay below designated limits—thus supporting a more stable and higher-quality energy flow within the system.

TIBCON power capacitors are designed to withstand harsh conditions and adverse environments that may reduce their lifespan during compensation processes.

• It features Overpressure disconnector system which prevents explosions by disconnecting the capacitor under internal thermal or electrical stress.
• Self healing metallized polypropylene film that ensures long-term durability even in challenging environments.

APPLICATIONS

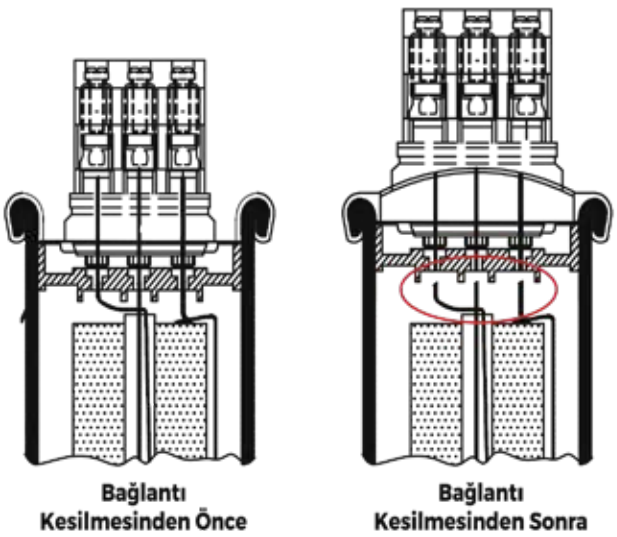
Our power capacitors, which offer a wide range of applications, are used in electrical control panels, industrial facilities, commercial enterprises, hotels, hospitals, shopping malls, agricultural irrigation systems, and similar application.

EXPLOSION PROTECTION

Capacitors may explode after prolonged exposure to overvoltage conditions. However, TIBCON capacitors are equipped with an internal overpressure valve or pressure protection system. As internal pressure rises, the capacitor expands, activating the system and preventing explosions.
• For instance, if a breakdown occurs in the capacitor winding due to overvoltage, the "self healing" feature is activated. If the self healing process fails to function properly (e.g., due to excessive voltage, current, or overload), the cover plate acting like a pressure relief valve rises and disconnects the wires connected to the winding. This isolates the capacitor from the grid.

DESIGN AND STRUCTURE

• MKP compact film, cylindrical aluminum case
• 3-phase delta/ Star 2P-1P connection
• Easy installation
• Environmentally friendly
• Impact-resistant terminals
• Long lifespan
• Reliable operation under harsh conditions
• Explosion proof design
• High power density resistant body
• Self healing metallized polypropylene film
• Low-loss zinc segments
• Vertical and horizontal mounting
(vertical recommended for extended life)
• Environmentally friendly, resin-filled impregnation system—completely free of polychlorinated biphenyls (PCB)



AŞIRI BASINÇ KORUMA BAĞLANTISI

TIBCON
ENERGY TECHNOLOGIES

Cylindircal and Box Type Power Capacitors – Technical Specifications

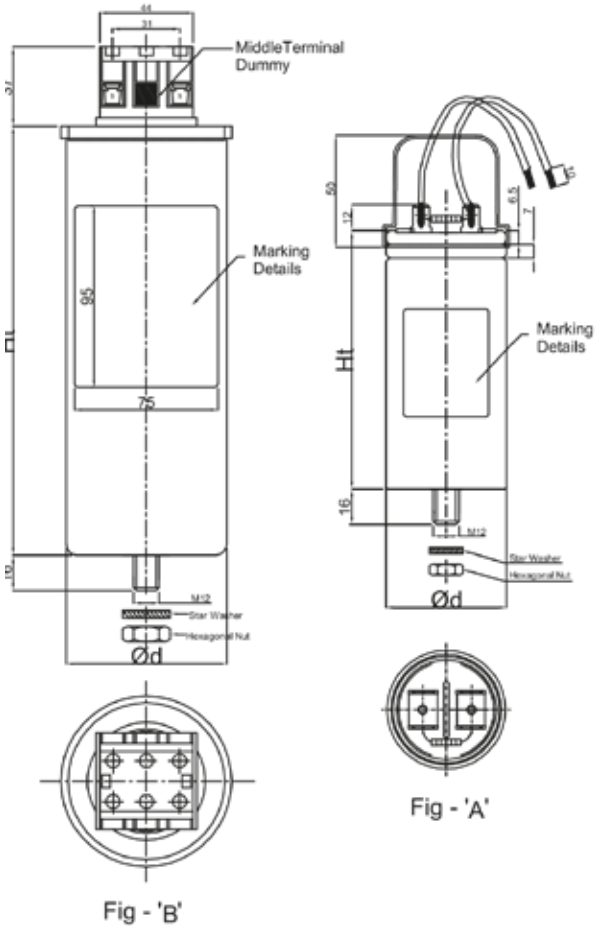
Standart/*Standard*	IEC 60831 - 1&2. IS: 13340
Tip/*Type*	**MKP Silindir**/ *Cylindrica* **MKP Çelik** /*Stee* / (Kutu Tip)
Güç Aralığı /*Rated Reactive Power*	**0.25 - 50 Kvar Tek Ünite** *Single Unit*
Anma Gerilimi /*Rated Voltage*	230 - 400 - 440- 480 - 525 - 690 - 830 **Volt**/*Volts*
Frekans /*Rated Frequency*	50/60 Hz
Maksimum aşırı Gerilim U Max/*Maksimum Over Voltage U Max*	**Un + %10 - 8 sa/24 sa/** *8h in every 24h* **Un+ %15 - 30 dk/ 24 sa/** *30 min in every 24h* **Un + %20 - 5dk/24 sa/** *5 min in every 24h* **Un+ %30 - 1dk/24sa/** *1 min in every 24h*
Dielektrik/*Dielectric System*	**MPP Film - Kendini Onarabilen** *Metallized Polyroplene Film, Self-Healing*
Aşırı Akım/*Over Current*	Up to 1.3*IR (2xin)
Kayıplar/*Losses*	**<0.2 Watt/Kvar (wit hout resistor)** **<0.45 Watt/ Kvar (wit h resistor)**
Koruma Sınıf/*Protection Cass*	**Ip20**
Soğutma /*Cooling*	**Doğal Soğutma/** *Natural Air Cooled*
Maksimum Yükseklik/*Max Above Sea Level*	**4000 mt**
Kasa/*Case*	**Alüminyum Kasa/ Kutu Tip Çelik Kasa** *Aluminium Case / Box Type Steel Case*
Deşarj/*Discharge Resistor*	**Dahili deşarj direnci 50 voltun altına 60 sn'de düşer.** *Special Oesing Internal Discharge Resistance 50 V in less than 60 sec.*
Terminal/*Terminals*	**16 mm Kablo Kesit ine Uygun Ark Korumalı Çift ve Üç Yönlü Terminal** *Max 76 mm Cable With Arc Protection* *Double Three Day Terminal*
Uygulama/*Execution*	**Dahili ve Harici/***İndoor and Outdoor*
Kullanım Ömrü/*Life Expectany*	**130.000 Saat/h 65°- 180.000 Saat/h 55°** **100.000 Saat/h -25° - 80.000 Saat/h -40°**
Darbe Akımı/*Inrush Current*	**200 xl' ye kadar**
Kapasite Toleransı/*Tolerance on Capacitance*	-%5 to +%10
Test Gerilimi Terminal/*Test Voltage Terminal ta Terminal*	**2,15xUn, AC 2 sn/***sec*
Test Gerilimi Kasa/*Test Voltage ta Casing*	**2xUn+2000 V veya 3000V AC 10 s**
Ortam Sıcaklığı/*Temperature Category*	**-25 C / 65 C (-40/D Temp. Cat 80.000)**
Montaj Pozisyonu/*Mounting Position*	**Yatay ve Dikey** **(Uzun ömür için dikey montaj tavsiye edilir.)** *Horizaontally and Vertícaly*
Maksimum Nem/*Max Humidity*	**95%**
Montaj ve Topraklama/*Grounding and Mounting*	**M12 Civata ile/***With M12 Stud*
Koruma Özelliği/*Protection Type*	**Kuru tip aşırı basınçta açan, kendi kendini onarabilen** *Dry Type, Self-Healing, Over Pressure Sensitive 3 Phase Disconnector*
Emdirme/*İmpregnant*	**PCB İçermez Reçineli Koruma** *Non PCB, Biodegradable Oil Semi Soft Jelly*

230V SINGLE-PHASE

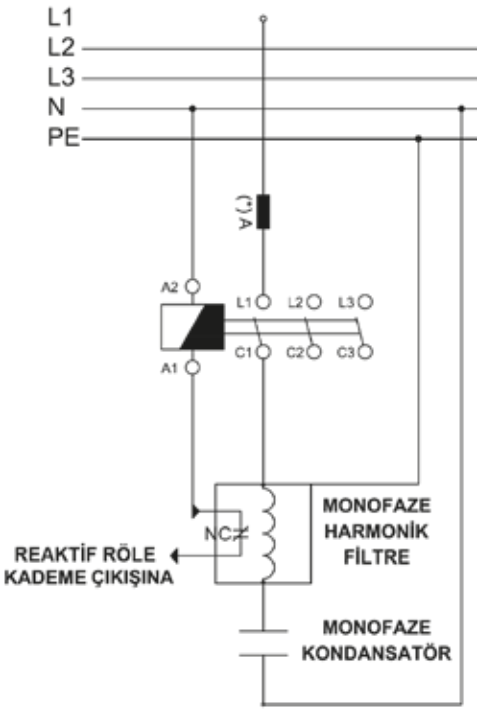
LOW VOLTAGE CYLINDRICAL TYPE CAPACITOR

Order Code	Product Code	Product Description	Qn at 230VAC (kVar)	Qn at 400VAC (kVar)	Dimensions DxH (mm)	c (uF)	In (A)	Figure
TBC1000	CYL-0.25-220-PİN	0.25 kVar Single-Phase Cylinder	0,25	0,75	63,5X87	15	1,08	A
TBC1001	CYL-0.50-220-PİN	0.50 kVar Single-Phase Cylinder	0,5	1,5	63,5X87	30	2,17	A
TBC1002	CYL-1-220-PİN	1.00 kVar Single-Phase Cylinder	1	3	63,5X87	60	4,35	A
TBC1003	CYL-1.5-220-PİN	1.50 kVar Single-Phase Cylinder	1,5	4,5	63,5X145	90	6,52	A
TBC1004	CYL-2,5-220-PİN	2.50 kVar Single-Phase Cylinder	2,5	7,5	63,5X145	150	10,87	A
TBC1005	CYL-3-220-PİN	3.00 kVar Single-Phase Cylinder	3	9	63,5X145	180	13,05	A
TBC1006	CYL-5-220-PİN	5.00 kVar Single-Phase Cylinder	5	15	76X210	0	21,75	A

Technical Drawing



Connection Diagram

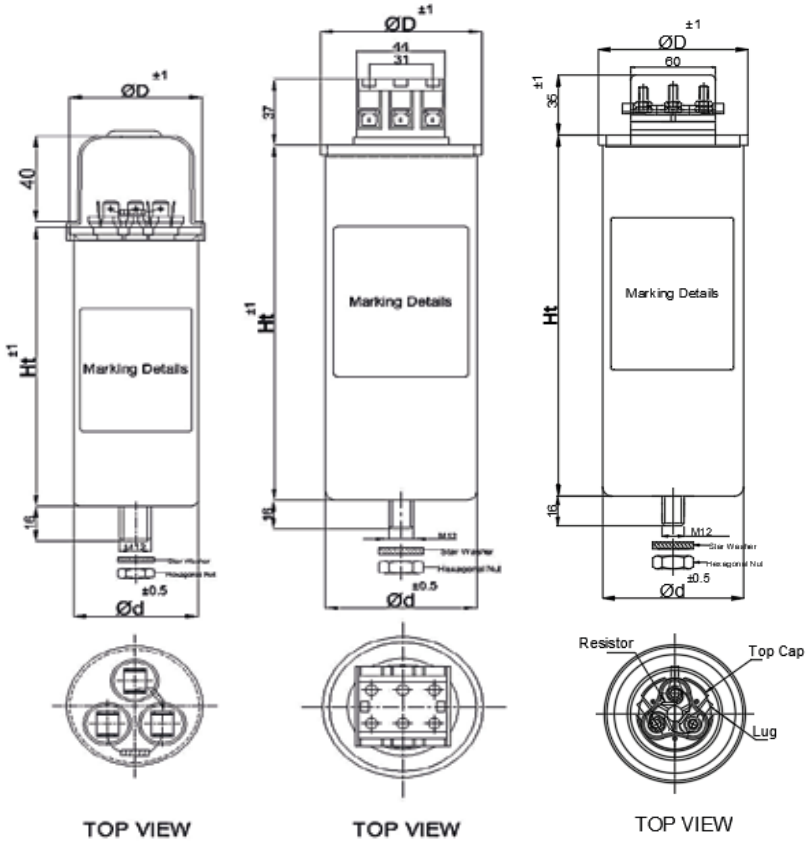


TIBCON
ENERGY TECHNOLOGIES

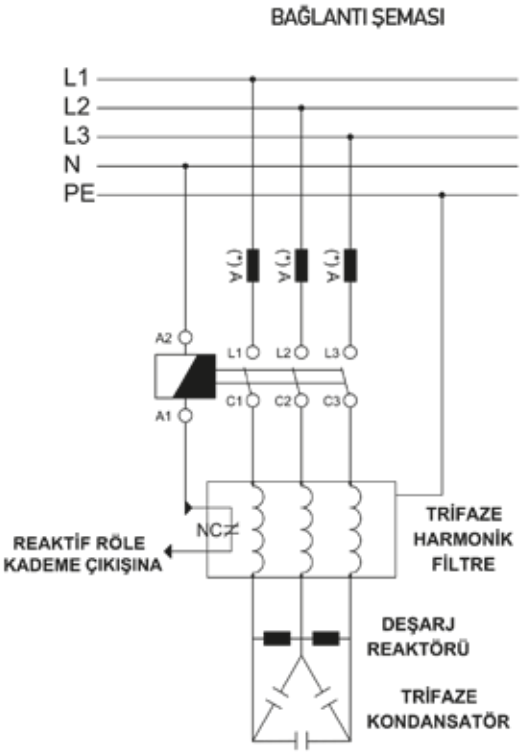
400V/415V/440V
LOW VOLTAGE CYLINDRICAL CAPACITORS

Order Code	Product Code	Product Description	Qn at 400VAC (kVAr)	Qn at 415VAC (kVAr)	Qn at 440VAC (kVAr)	Dimensions DxH (mm)	c (uF)	In (A)	Figure
TBC1100	CYL-0.5-400-PİN	0.5 kVAr 400V Cylindrical Capacitor	0,5	0,54	0,61	63,5X87	3x3,32	0,72	A
TBC1101	CYL-1-400-PİN	1 kVAr 400V Cylindrical Capacitor	1	1,08	1,21	63,5X87	3x6,64	1,44	A
TBC1102	CYL-1.5-400-PİN	1.5 kVAr 400V Cylindrical Capacitor	1,5	1,61	1,81	63,5X87	3x9,96	2,16	A
TBC1103	CYL-2,5-400-PİN	2.5 kVAr 400V Cylindrical Capacitor	2,5	2,69	3,03	63,5X87	3x16,6	3,6	A
TBC1104	CYL-5-400-415-440 V-SCR	5 kVAr 400–415–440V Cylindrical Capacitor	5	5,4	6,05	63,5X160	3x33,2	7,2	B
TBC1105	CYL-7,5-400-415-440V-SCR	7.5 kVAr 400–415–440V Cylindrical Capacitor	7,5	8	9	63,5X160	3x49,8	10,8	B
TBC1106	CYL-10-400-415-440V-SCR	10 kVAr 400–415–440V Cylindrical Capacitor	10	11	12	76X210	3x66,4	14,4	B
TBC1107	CYL-12,5-400-415-440VSCR	12.5 kVAr 400–415–440V Cylindrical Capacitor	12,5	13,5	15	76X210	3x83	18	B
TBC1108	CYL-15-400-415-440V-SCR	15 kVAr 400–415–440V Cylindrical Capacitor	15	16	18,2	85X210	3x99,6	21,6	B
TBC1109	CYL-20-400-415-440V-SCR	20 kVAr 400–415–440V Cylindrical Capacitor	20	21,5	24,2	95X247	3x133	28,8	B
TBC1110	CYL-25-400-415-440V-SCR	25 kVAr 400–415–440V Cylindrical Capacitor	25	27	30	100X278	3x166	36	B
TBC1111	CYL-30-400-415-440V-SCR	30 kVAr 400–415–440V Cylindrical Capacitor	30	32	36	116X278	3x199,2	43,2	C
TBC1112	CYL-40-400-415-440V-SCR	40 kVAr 400–415–440V Cylindrical Capacitor	40	43	48	136X247	3x265	57,6	C
TBC1113	CYL-50-400-415-440V-SCR	50 kVAr 400–415–440V Cylindrical Capacitor	50	54	60,5	136X247	3x332	72	C

Technical Drawing



Connection Diagram

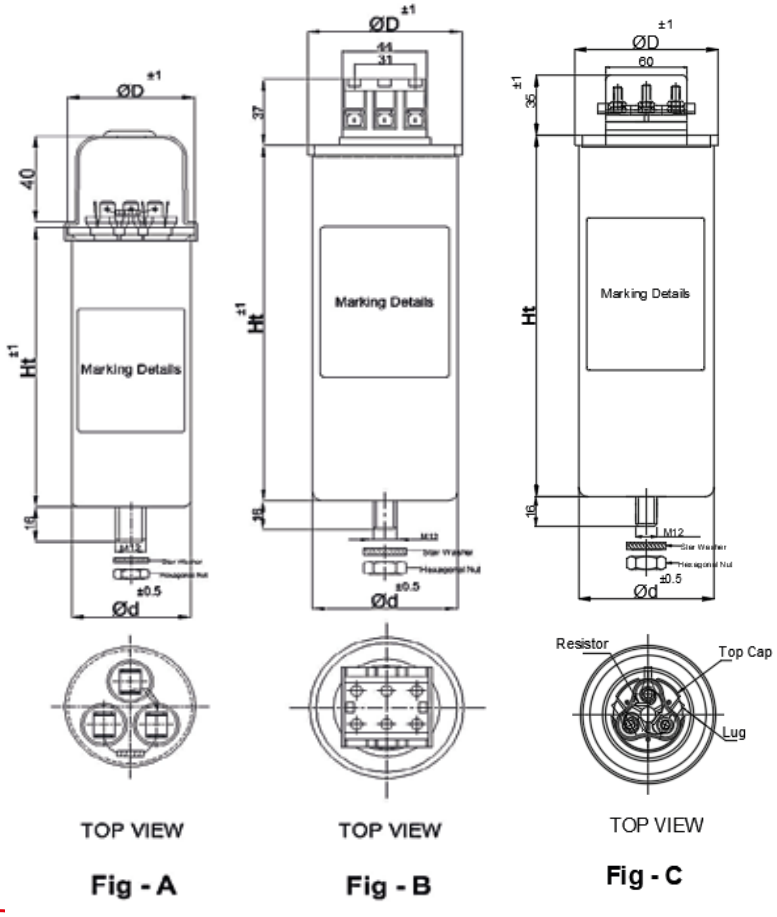


HEAVY DUTY LOW VOLTAGE CYLINDRICAL CAPACITORS

RATED FOR 440V / 450V / 460V

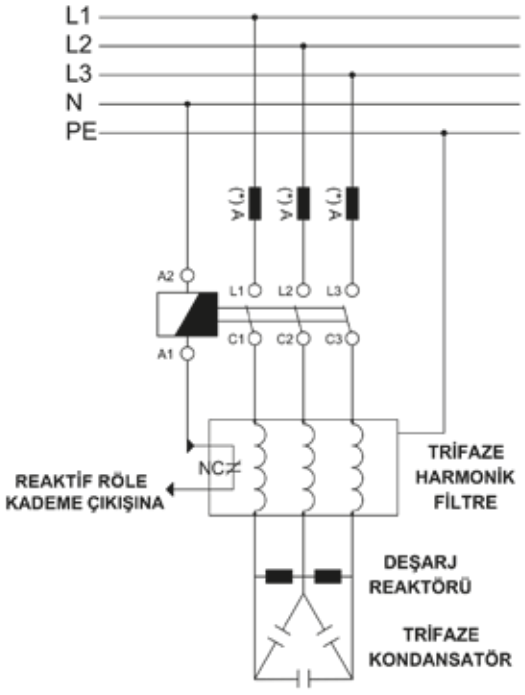
Order Code	Product Code	Product Description	Qn at 440 VAC (kVAr)	Qn at 450VAC (kVAr)	Qn at 460 (kVAr)	Dimensions DxH (mm)	c (uF)	In (A)	Figure
TBC1300	CYL-2.5-440-PİN	2,5 KVAR H.DUTY 440-450-460V SİLİNDİR	2,5	2,6	2,7	63,5X87	3x13,75	3,27	A
TBC1301	HD-CYL-5-440-SCR	5 KVAR H.DUTY 440-450-460V SİLİNDİR	5	5,2	5,5	63,5X135	3X27,5	6,55	B
TBC1302	HD-CYL-7.5-440-SCR	7,5 KVAR H.DUTY 440-450-460V SİLİNDİR	7,5	7,84	8,2	76X175	3X41,25	9,82	C
TBC1303	HD-CYL-10-440-SCR	10 KVAR H.DUTY 440-450-460V SİLİNDİR	10	10,46	10,93	76X210	3X55	13,1	C
TBC1304	HD-CYL-12,5-440-SCR	12,5 KVAR H.DUTY 440-450-460V SİLİNDİR	12,5	13,07	13,66	76X247	3X69	16,4	C
TBC1305	HD-CYL-14.1-440-SCR	14,1 KVAR H.DUTY 440-450-460V SİLİNDİR	14,1	14,75	15,41	76X247	3X77	18,5	C
TBC1306	HD-CYL-15-440-SCR	15 KVAR H.DUTY 440-450-460V SİLİNDİR	15	15,69	16,39	76X247	3X82,5	19,7	C
TBC1307	HD-CYL-20-440-SCR	20 KVAR H.DUTY 440-450-460V SİLİNDİR	20	20,92	21,86	85X278	3X110	26,2	C
TBC1308	HD-CYL-25-440-SCR	25 KVAR H.DUTY 440-450-460V SİLİNDİR	25	26,15	27,32	85X278	3X137	33	C
TBC1309	HD-CYL-28.2-440-SCR	28,2 KVAR H.DUTY 440-450-460V SİLİNDİR	28,2	29,5	30,82	85X353	3X155	37	C
TBC1310	HD-CYL-30-440-SCR	30 KVAR H.DUTY 440-450-460V SİLİNDİR	30	31,38	32,79	85X353	3X165	39,3	C

Technical Drawing



Connection Diagram

BAĞLANTI ŞEMASI



TIBCON ENERGY TECHNOLOGIES

400V/415V/440V (BOX)

LOW VOLTAGE CYLINDRICAL CAPACITORS

Order Code	Product Code	Product Description	400 VAC Qn (kVAr)	415 VAC Qn (kVAr)	440 VAC Qn (kVAr)	Dimensions DxH (mm)	c (uF)	In (A)	Figure
TBC1200	BOX-0.5-400-SCR	0,5 KVAR BOX CAPACITOR	0,5	0,54	0,61	123X44X145	3X3,32	0,72	A
TBC1201	BOX-1-400-SCR	1 KVAR BOX CAPACITOR	1	1,08	1,21	123X44X145	3X6,64	1,44	A
TBC1202	BOX-1.5-400-SCR	1,5 KVAR BOX CAPACITOR	1,5	1,61	1,81	123X44X145	3X9,96	2,16	A
TBC1203	BOX-2,5-400-SCR	2,5 KVAR BOX CAPACITOR	2,5	2,69	3,03	123X44X145	3X16,6	3,6	A
TBC1204	BOX-5-400-SCR	5 KVAR BOX CAPACITOR	5	5,38	6,05	140X50X213	3X33,2	7,2	A
TBC1205	BOX-7.5-400-SCR	7,5 KVAR BOX CAPACITOR	7,5	8,07	9,08	157X54X213	3X50	11	A
TBC1206	BOX-10-400-SCR	10 KVAR BOX CAPACITOR	10	10,76	12,1	178X62X218	3X66,4	14,5	B
TBC1207	BOX-12,5-400-SCR	12,5 KVAR BOX CAPACITOR	12,5	13,5	15,2	202X72X236	3X83	18	B
TBC1208	BOX-15-400-SCR	15 KVAR BOX CAPACITOR	15	16,15	18,16	202X72X236	3X100	21,6	B
TBC1209	BOX-20-400-SCR	20 KVAR BOX CAPACITOR	20	21,6	24,2	225X77X236	3X133	28,8	B
TBC1210	BOX-25-400-SCR	25 KVAR BOX CAPACITOR	25	26,9	30,3	225X77X236	3X166	36	B
TBC1211	BOX-30-400-SCR	30 KVAR BOX CAPACITOR	30	32,3	36,3	225X77X236	3X200	43,2	B
TBC1212	BOX-40-400-SCR	40 KVAR BOX CAPACITOR	40	43,06	48,4	227X80X280	3X266	57,6	B

Technical Drawing

TEKNİK ÇİZİMİ

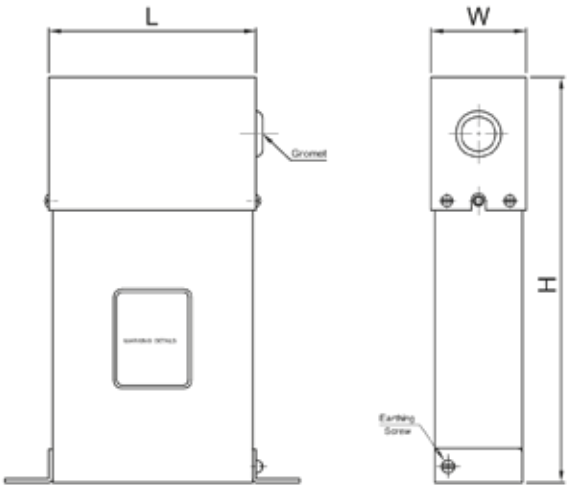


Fig - A

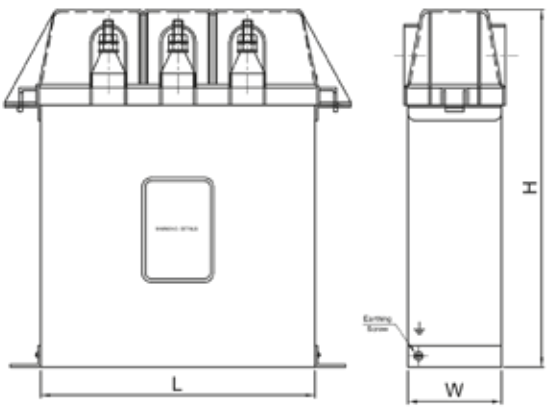


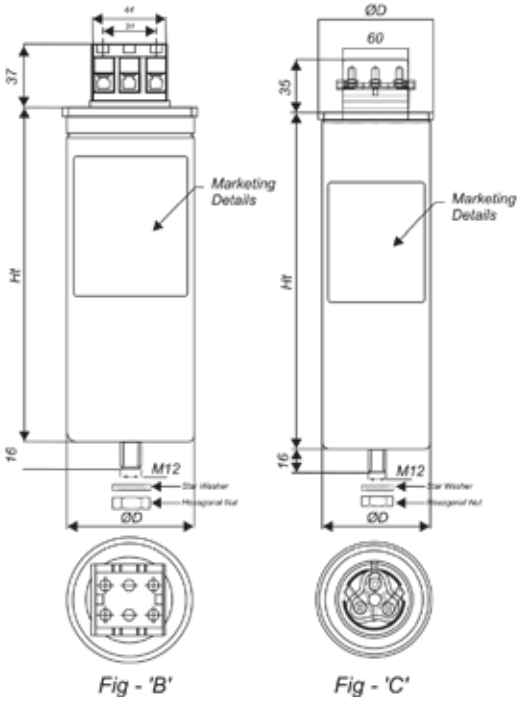
Fig - B

Heavy Duty Cylindrical Capacitors

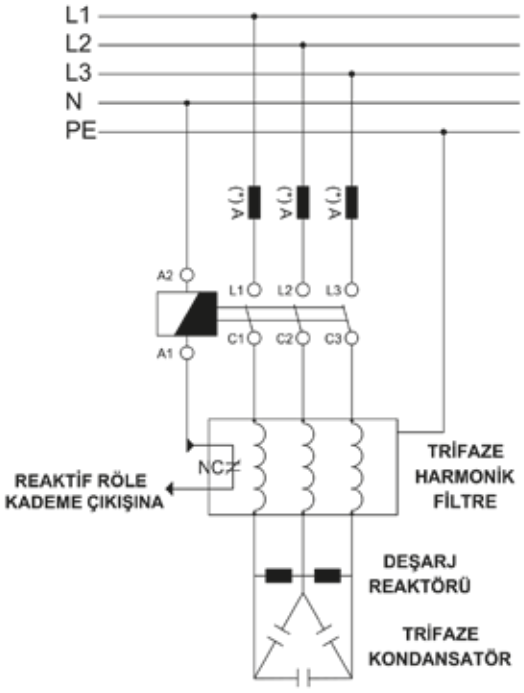
Rated for 480V / 525V

Order Code	Product Code	Product Description	480 VAC Qn (kVAr)	525 VAC Qn (kVAr)	440 VAC Qn (kVAr)	400 VAC Qn (kVAr)	Dimensions DxH (mm)	c (uF)	In (A)	Figure
TBC1400	CYL-5-480-SCR	5 KVAR 480-525V CYLINDRICAL	5	5,98	4,2	3,5	76X210	3x23,05	6	B
TBC1401	CYL-7.5-480-SCR	7,5 KVAR 480-525V CYLINDRICAL	7,5	8,97	6,3	5,2	76X210	3x34,6	9	B
TBC1402	CYL-10-480-SCR	10 KVAR 480-525V CYLINDRICAL	10	11,96	8,4	6,9	76X210	3x46,1	12	B
TBC1403	CYL-12,5-480-SCR	12,5 KVAR 480-525V CYLINDRICAL	12,5	14,95	10,5	8,7	85X210	3x57,7	15	B
TBC1405	CYL-15-480-SCR	15 KVAR 480-525V CYLINDRICAL	15	17,94	12,6	10,4	95X210	3x69,15	18	B
TBC1404	CYL-16,7-480-SCR	16,7 KVAR 480-525 V CYLINDRICAL	16,7	19,94	14,03	11,6	95X210	3X76,99	20	B
TBC1406	CYL-20-480-SCR	20 KVAR 480-525V CYLINDRICAL	20	23,93	16,8	13,9	94X247	3x92,2	24	B
TBC1407	CYL-25-480-SCR	25 KVAR 480-525V CYLINDRICAL	25	29,91	21	17,4	116X247	3x115	30	C
TBC1408	CYL-30-480-SCR	30 KVAR 480-525V CYLINDRICAL	30	35,89	25,2	20,8	116X247	3x138,3	36	C
TBC1409	CYL-33,30-480-SCR	33,30 KVAR 480-525V CYLINDRICAL	33,3	39,83	28	23,1	136X247	3x153,5	39,9	C

Technical Drawing



Connection Diagram



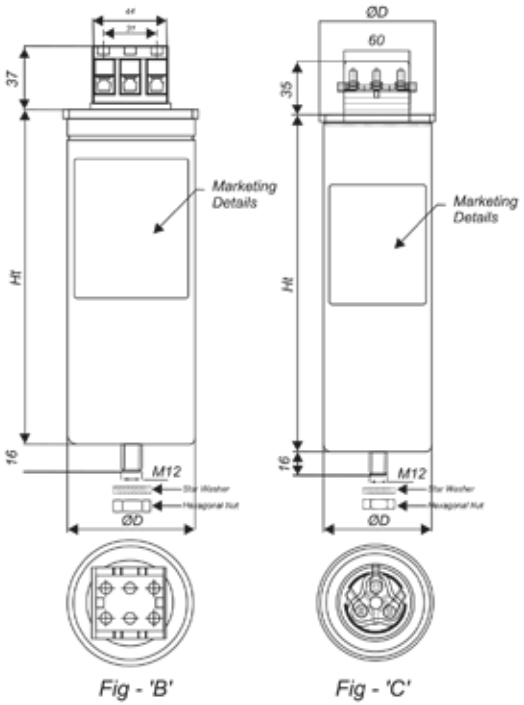
Super Heavy Duty Cylindrical Capacitors

Rated for 525V

Order Code	Product Code	Product Description	525 VAC Qn (kVAr)	480VAC Qn (kVAr)	440 VAC Qn (kVAr)	400 VAC Qn (kVAr)	Boyutlar (mm)	c (uF)	In (A)	Figure
TBC1500	SHD-CYL-5-525-SCR	5 KVAR SUPER H.DUTY 525V CYLINDRICAL	5	4,2	3,5	2,9	76X175	3x19,3	5,5	B
TBC1501	SHD-CYL-7,5-525-SCR	7,5 KVAR SUPER H.DUTY 525V CYLINDRICAL	7,5	6,3	5,3	4,4	76X210	3x28,9	8,3	B
TBC1502	SHD-CYL-10-525-SCS	10 KVAR SUPER H.DUTY 525V CYLINDRICAL	10	8,4	7	5,8	85X210	3x38,5	11	B
TBC1503	SHD-CYL-12,5-525-SCR	12,5 KVAR SUPER H.DUTY 525V CYLINDRICAL	12,5	10,5	8,8	7,3	85X210	3x48,3	13,8	B
TBC1504	SHD-CYL-15-525-SCR	15 KVAR SUPER H.DUTY 525V CYLINDRICAL	15	12,5	10,6	8,7	95X210	3x57,8	16,5	B
TBC1505	SHD-CYL-16,7-525-SCR	16,7 KVAR SUPER H.DUTY 525 V CYLINDRICAL	16,7	14	11,8	9,7	94X247	3x64,3	18,4	B
TBC1506	SHD-CYL-20-525-SCR	20 KVAR SUPER H.DUTY 525V CYLINDRICAL	20	16,8	14	11,6	110X210	3x77	22	B
TBC1507	SHD-CYL-25-525-SCR	25 KVAR SUPER H.DUTY 525V CYLINDRICAL	25	20,9	17,6	14,5	116X247	3x96,3	27,5	C
TBC1508	SHD-CYL-30-525-SCR	30 KVAR SUPER H.DUTY 525V CYLINDRICAL	30	25	21	17,4	116X247	3x115,5	33	C
TBC1509	SHD-CYL-40-525-SCR	40 KVAR SUPER H.DUTY 525V CYLINDRICAL	40	33,5	28,1	23,2	136X247	3x154	44	C

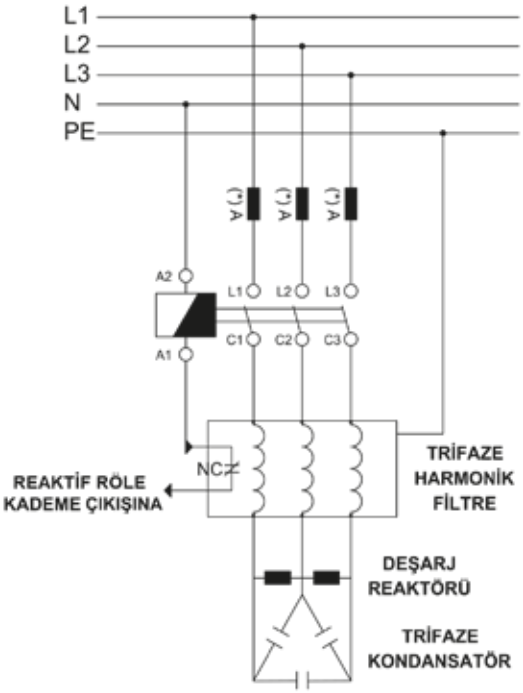
Technical Drawing

TEKNİK ÇİZİMİ



Connection Diagram

BAĞLANTI ŞEMASI



690V/830V SÜPER AĞIR HİZMET

ALÇAK GERİLİM SİLİNDİR TİP KONDANSATÖR

Order Code	Product Code	Product Description	690 VAC İçin Qn (kVAr)	660 VAC İçin Qn (kVAr)	600 VAC İçin Qn (kVAr)	Boyutlar DxH (mm)	c (uF)	In (A)	Figure
TBC1600	SHD-CYL-20-690-SCR	20 KVAR SUPER H.DUTY 690V CYLINDRICAL	20	18,5	15,2	95X247	3x44,6	16,8	B
TBC1601	SHD-CYL-25-690-SCR	25 KVAR SUPER H.DUTY 690V CYLINDRICAL	25	23	19	116X210	3x55,8	21	C
TBC1602	SHD-CYL-30-690-SCR	30 KVAR SUPER H.DUTY 690V CYLINDRICAL	30	27,5	22,7	116X247	3x67	25,2	C

Order Code	Product Code	Product Description	830 VAC İçin Qn (kVAr)	740 VAC İçin Qn (kVAr)	690 VAC İçin Qn (kVAr)	Boyutlar DxH (mm)	c (uF)	In (A)	Figure
TBC1700	SHD-CYL-20-830-SCR	20 KVAR SUPER H.DUTY 830V CYLINDRICAL	20	15,9	13,8	95X247	3x30,8	14	C
TBC1701	SHD-CYL-30-830-SCS	30 KVAR SUPER H.DUTY 830V CYLINDRICAL	30	23,8	20,8	116X247	3x46,2	21	C
TBC1702	SHD-CYL-40-830-SCR	40 KVAR SUPER H.DUTY 830V CYLINDRICAL	40	31,8	27,7	136X247	3x61,6	28	C

Technical Drawing

TEKNİK ÇİZİMİ

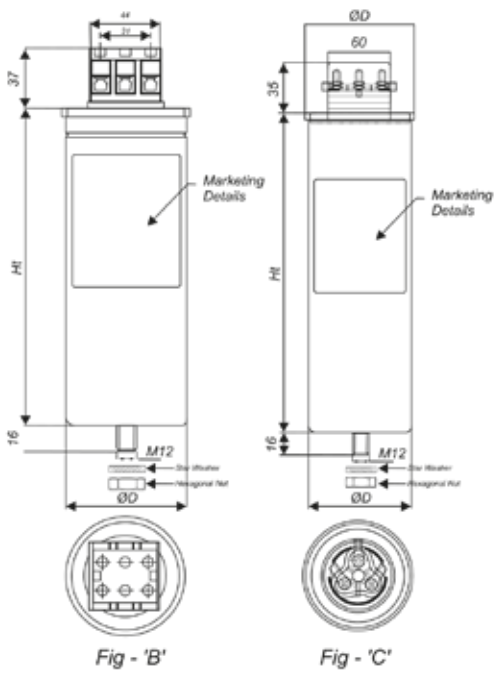
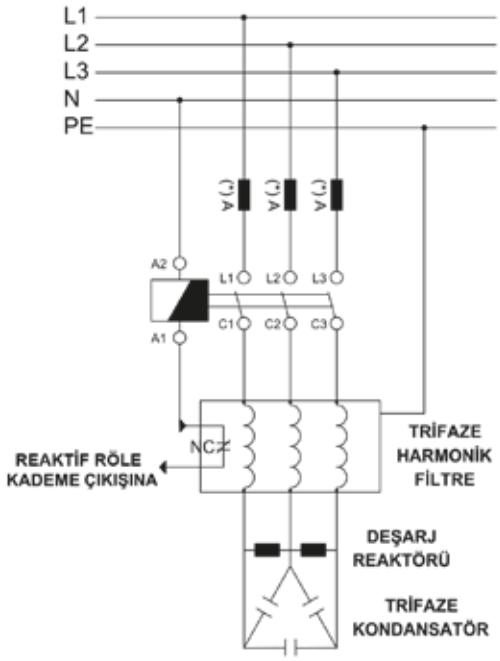


Fig - 'B' Fig - 'C'

Connection Diagram

BAĞLANTI ŞEMASI



TIBCON ENERGY TECHNOLOGIES

HEAVY DUTY MODULAR DRY TYPE VERMICULITE FILLED CAPACITOR

MODULAR DRY TYPE CAPACITOR (VERMICULITE FILLED)

GENERAL FEATURES

HEAVY DUTY DRY TYPE VERMICULITE FILLED STAINLESS STEEL CASE CAPACITOR

Tibcon modular dry type capacitors are used for reactive power compensation in all industrial and commercial facilities.

They are especially suitable for use with harmonic filter reactors in heavy industrial plants.
With the rapidly increasing energy demand today, the efficient and high-quality production, transmission, distribution, and consumption of energy have become critically important. Capacitors, which are installed as an initial investment, are expected to operate reliably and with high performance over a long period, minimize losses during operation, and continue functioning sustainably without failure under any electrical surge from the grid.

Tibcon dry-type capacitors, which are fully dry-type low voltage power capacitors, do not contain any liquid or gas filling materials. They are entirely safe against fire and explosion. Combined with an environmentally friendly, PCB-free, and self-healing design, they offer high reliability.
This dry-type capacitor series is designed for demanding industries such as cement, chemical, iron-steel, paper, and textile. With their zinc-electrolytic steel body and IP42 protection class, they are suitable for all harsh operating conditions.
For grids with poor power quality, dry-type low-voltage power capacitors are designed to withstand 30% continuous overcurrent.
Additionally, during production, all capacitors are tested between terminals at 2.15 times their rated voltage for 10 seconds to ensure full reliability against voltage surges that may occur during field operation.
Thanks to their compact size, TIBCON dry-type low-voltage power capacitors can be easily mounted on any types of panels. In addition to internal and external applications such as fixed motor compensation, they can also be used step-by-step in automatic compensation systems.
Discharge resistors bring the capacitor voltage below 50 volts within 1 minute, current surges during contactor switching applications are kept to a minimum.

MODULAR DRY TYPE CAPACITOR (VERMICULITE-FILLED)

TECHNICAL SPECIFICATIONS

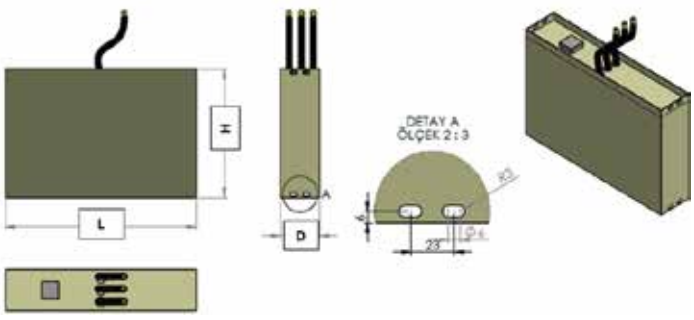
Order Code	Product Code	Product Description	Power	Capacity	Current	Dimensions DxH (mm)
TBVR6501	TBC-ASM-400-12,5	400V 12,5 kVAr Vermiculite-Filled Capacitor	12,5	249	18,1	78x340x255
TBVR6502	TBC-ASM-400-15	400V 15 kVAr Vermiculite-Filled Capacitor	15	300	21,7	78x340x255
TBVR6503	TBC-ASM-400-20	400v 20 kVAr Vermiculite-Filled Capacitor	20	400	29	78x340x255
TBVR6504	TBC-ASM-400-25	400V 25 kVAr Vermiculite-Filled Capacitor	25	500	36	78x340x255
TBVR6509	TBC-ASM-440-14,1	440V 14,01 kVAr Vermiculite-Filled Capacitor	14,1	232	18,5	78x340x255
TBVR6515	TBC-ASM-440-25	440V 25 kVAr Vermiculite-Filled Capacitor	25	411	32,8	78x340x255
TBVR6518	TBC-ASM-440-28,2	440V 28,2 kVAr Vermiculite-Filled Capacitor	28,2	464	37	78x340x255
TBVR6526	TBC-ASM-457-14,1	457V 14,01 kVAr Vermiculite-Filled Capacitor	14,1	215	17,8	78x340x255
TBVR6527	TBC-ASM-457-28,2	457V 28,2 kVAr Vermiculite-Filled Capacitor	28,2	430	35,7	78x340x255
TBVR6534	TBC-ASM-480-16,6	480V 16,6 kVAr Vermiculite-Filled Capacitor	16,6	229,5	20	78x340x255
TBVR6535	TBC-ASM-480-20	480V 20 kVAr Vermiculite-Filled Capacitor	20	276,4	24,08	78x340x255
TBVR6540	TBC-ASM-480-33,3	480V 33,3 kVAr Vermiculite-Filled Capacitor	33,3	460,3	40,1	78x340x255
TBVR6545	TBC-ASM-525-18,6	525V 18,6 kVAr Vermiculite-Filled Capacitor	18,6	18,6	20,5	78x340x255
TBVR6550	TBC-ASM-525-37,2	525V 37,2 kVAr Vermiculite-Filled Capacitor	37,2	37,2	41	78x340x255
TBVR6554	TBC-ASM-525-40	525V 40 kVAr Vermiculite-Filled Capacitor	40	40	44	78x340x255

* Available up to 250 kVAr in a single case upon request.

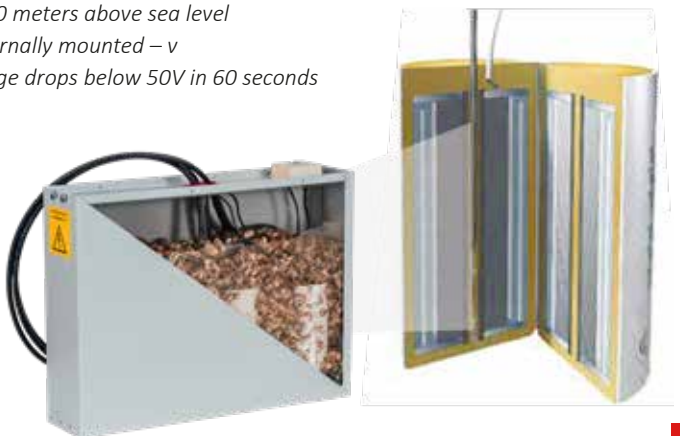
Rated Voltage: *230-...-1000 V AC.*
Rated Frequency: *50-60 Hz.*
Reference Standard: *IEC 60831-1&2- TS EN 60831-1/2*
Case Terminal Test Voltage: *3kV AC 10 sn.*
Losses Without Discharge Resistor: *(Watt/kVAr)<0,2*
Losses With Discharge Resistor: *(Watt/kVAr)<0,45*
Operating Temperature Range:: *-40°C to 65°C*
Capacitance Tolerance: *%-5/+10*
Connection Terminal: *M8 or M10 bolts*
Protection Class: *IP42 (Upgradable to IP54 upon request)*
Surge Current Withstand: *200 ile 400X*
Filling Material: *Anti-toxic Vermiculite Granules*
Enclosure Material: *Stainless Steel (Optional Outdoor Type)*
Montaj pozisyon: *Yatay veya dikey*
Color: *RAL7035 (Other colors available upon request)*
Maximum Humidity: *85%*
Connection Type: *Delta, Single-Phase, or Optional Configurations*
Maximum Operating Altitude: *4000 meters above sea level*
Discharge Resistor: *Externally mounted – v oltage drops below 50V in 60 seconds*

Technical Drawing

Teknik Çizim



- Power Cables
- Discharge Resistors
- Metal Body
- Dielectric Structure
- Inorganic Flame Retardant
- Non-toxic Granules
- Self-Healing Technology



Internal Structure Components:

- Cable Connection
- Metal End Spray Layer
- Metallized Polypropylene Film
- Second Foil Winding
- Biaxially Oriented Polypropylene Film
- Heat-Cured Coating
- Plastic Housing

MEDIUM VOLTAGE CAPACITORS (MV)

TIBCON
ENERGY TECHNOLOGIES

MV CAPACITORS

Magnewin MV capacitors are used in medium-voltage systems to provide reactive power compensation and improve energy efficiency. Operating within a voltage range of 1 kV to 36 kV, these capacitors offer a reliable and long-lasting solution for industrial facilities, transformer substations, and MV panels.
Magnewin MV capacitors, which stand out with their high-quality dielectric material and advanced engineering design, are manufactured in compliance with IEC 60871-1 and BIS 13925 standards. They demonstrate high resistance against overvoltage, harmonic distortion, and harsh environmental conditions.
At TIBCON, we offer Magnewin MV capacitors with competitive pricing and guaranteed technical support.
The table below contains the technical specifications of our Magnewin MV capacitor products. Please contact us for pricing or project-specific requirements.

KEY FEATURES

- Latest technology
- PCB-free
- Maintenance-free
- Easy to dispose of
- Internal/External fuse and built-in discharge resistor
- Long lifespan
- Environmentally friendly

STANDARD RATINGS OF CAPACITORS

The standard single-unit capacitor ratings are as follows:

- kVAr Ratings: 50, 75, 100... up to 1000 kVAr
- Phase: Single-phase / Three-phase
- Fuse: Internal / External
- Voltage: 1.1, 3.3, 3.6, 4.2, 6.6, 6.99, 7.3, ... up to 24 kV
- Frequency: 50 / 60 Hz

Design & Protection Features

- Dielectric & Electrode:

As the dielectric material, an environmentally friendly, PCB-free, double-sided hazy polypropylene film is used. For electrodes, 99.9% soft-annealed aluminum foil is utilized, with sufficient thickness, folded edges, and end folds.

- Dielectric Losses:
  - o For external fuse: Less than 0.1 W/kVAr
  - o For internal fuse: Less than 0.15 W/kVAr
  - o No performance degradation over time

Protection System:

Each component is protected with individual fuses compliant with IEC 60871-4 standards. Internal fuses are specifically designed and placed to isolate only the faulty element, allowing the rest of the elements and the capacitor bank to continue operating without interruption. Magnewin has developed its own in-house testing facility to carry out Internal Fuse Tests in accordance with IEC 60871-4. Capacitors with external fuses are also available upon special request.
Testing & Certification
All capacitors are tested in our well-equipped On-Site Test Laboratory in compliance with IEC 60871 and IS 13925 standards. Magnewin capacitors are regularly subjected to type tests according to IEC 60871 and IS 13925 standards. In addition, Magnewin capacitors have undergone endurance testing in a NABL-accredited independent national laboratory, in accordance with IEC 60871-2.

MV CAPACITORS (MEDIUM VOLTAGE)
TECHNICAL SPECIFICATIONS

Order Code	Product Code	Product Description	Voltage (kV)	Power (kVAr)	Faz	Bushing
TBOG3600	OG-6,062-75-1P	6,062 kV 75 kVAr 1 ph 1 bushings MV Capacitor	6,062	75	1P	1
TBOG3601	OG-6,062-100-1P	6,062 kV 100 kVAr 1 ph 1 bushings MV Capacitor	6,062	100	1P	1
TBOG3602	OG-6,062-150-1P	6,062 kV 150 kVAr 1 ph 1 bushings MV Capacitor	6,062	150	1P	1
TBOG3603	OG-6,062-200-1P	6,062 kV 200 kVAr 1 ph 1 bushings MV Capacitor	6,062	200	1P	1
TBOG3604	OG-6,062-300-1P	6,062 kV 300 kVAr 1 ph 1 bushings MV Capacitor	6,062	300	1P	1
TBOG3605	OG-6,062-400-417-1P	6,062 kV 400-417 kVAr 1 ph 1 bushings MV Capacitor	6,062	400-417	1P	1
TBOG3606	OG-9,122-75-1P	9,122 kV 75 kVAr 1 ph 1 bushings MV Capacitor	9,122	75	1P	1
TBOG3607	OG-9,122-100-1P	9,122 kV 100 kVAr 1 ph 1 bushings MV Capacitor	9,122	100	1P	1
TBOG3608	OG-9,122-150-1P	9,122 kV 150 kVAr 1 ph 1 bushings MV Capacitor	9,122	150	1P	1
TBOG3609	OG-9,122-200-1P	9,122 kV 200 kVAr 1 ph 1 bushings MV Capacitor	9,122	200	1P	1
TBOG3610	OG-9,122-300-1P	9,122 kV 300 kVAr 1 ph 1 bushings MV Capacitor	9,122	300	1P	1
TBOG3611	OG-9,122-400-417-1P	9,122 kV 400-417 kVAr 1 ph 1 bushings MV Capacitor	9,122	400-417	1P	1
TBOG3612	OG-19,918-75-1P	19,918 kV 75 kVAr 1 ph 1 bushings MV Capacitor	19,918	75	1P	1
TBOG3613	OG-19,918-100-1P	19,918 kV 100 kVAr 1 ph 1 bushings MV Capacitor	19,918	100	1P	1
TBOG3614	OG-19,918-150-1P	19,918 kV 150 kVAr 1 ph 1 bushings MV Capacitor	19,918	150	1P	1
TBOG3615	OG-19,918-200-1P	19,918 kV 200 kVAr 1 ph 1 bushings MV Capacitor	19,918	200	1P	1
TBOG3616	OG-19,918-300-1P	19,918 kV 300 kVAr 1 ph 1 bushings MV Capacitor	19,918	300	1P	1
TBOG3617	OG-19,918-400-417-1P	19,918 kV 400-417 kVAr 1 ph 1 bushings MV Capacitor	19,918	400-417	1P	1
TBOG3618	OG-3,3-50-3P	3,3 kV 50 kVAr 3 ph 3 bushings MV Capacitor	3,3	50	3P	3
TBOG3619	OG-3,3-75-3P	3,3 kV 75 kVAr 3 ph 3 bushings MV Capacitor	3,3	75	3P	3
TBOG3620	OG-3,3-100-3P	3,3 kV 100 kVAr 3 ph 3 bushings MV Capacitor	3,3	100	3P	3
TBOG3621	OG-3,3-125-3P	3,3 kV 125 kVAr 3 ph 3 bushings MV Capacitor	3,3	125	3P	3
TBOG3622	OG-3,3-150-3P	3,3 kV 150 kVAr 3 ph 3 bushings MV Capacitor	3,3	150	3P	3
TBOG3623	OG-3,3-200-3P	3,3 kV 200 kVAr 3 ph 3 bushings MV Capacitor	3,3	200	3P	3
TBOG3624	OG-3,3-250-3P	3,3 kV 250 kVAr 3 ph 3 bushings MV Capacitor	3,3	250	3P	3
TBOG3625	OG-3,3-300-3P	3,3 kV 300 kVAr 3 ph 3 bushings MV Capacitor	3,3	300	3P	3
TBOG3626	OG-3,3-400-3P	3,3 kV 400 kVAr 3 ph 3 bushings MV Capacitor	3,3	400	3P	3
TBOG3627	OG-3,3-500-3P	3,3 kV 500 kVAr 3 ph 3 bushings MV Capacitor	3,3	500	3P	3
TBOG3628	OG-3,3-600-3P	3,3 kV 600 kVAr 3 ph 3 bushings MV Capacitor	3,3	600	3P	3
TBOG3629	OG-3,3-660-3P	3,3 kV 660 kVAr 3 ph 3 bushings MV Capacitor	3,3	660	3P	3
TBOG3630	OG-6,3-50-3P	6,3 kV 50 kVAr 3 ph 3 bushings MV Capacitor	6,3	50	3P	3
TBOG3631	OG-6,3-75-3P	6,3 kV 75 kVAr 3 ph 3 bushings MV Capacitor	6,3	75	3P	3
TBOG3632	OG-6,3-100-3P	6,3 kV 100 kVAr 3 ph 3 bushings MV Capacitor	6,3	100	3P	3
TBOG3633	OG-6,3-125-3P	6,3 kV 125 kVAr 3 ph 3 bushings MV Capacitor	6,3	125	3P	3
TBOG3634	OG-6,3-150-3P	6,3 kV 150 kVAr 3 ph 3 bushings MV Capacitor	6,3	150	3P	3
TBOG3635	OG-6,3-200-3P	6,3 kV 200 kVAr 3 ph 3 bushings MV Capacitor	6,3	200	3P	3
TBOG3636	OG-6,3-250-3P	6,3 kV 250 kVAr 3 ph 3 bushings MV Capacitor	6,3	250	3P	3
TBOG3637	OG-6,3-300-3P	6,3 kV 300 kVAr 3 ph 3 bushings MV Capacitor	6,3	300	3P	3
TBOG3638	OG-6,3-400-3P	6,3 kV 400 kVAr 3 ph 3 bushings MV Capacitor	6,3	400	3P	3
TBOG3639	OG-6,3-500-3P	6,3 kV 500 kVAr 3 ph 3 bushings MV Capacitor	6,3	500	3P	3
TBOG3640	OG-6,3-600-3P	6,3 kV 600 kVAr 3 ph 3 bushings MV Capacitor	6,3	600	3P	3
TBOG3641	OG-6,3-660-3P	6,3 kV 660 kVAr 3 ph 3 bushings MV Capacitor	6,3	660	3P	3
TBOG3642	OG-7,2-50-3P	7,2 kV 50 kVAr 3 ph 3 bushings MV Capacitor	7,2	50	3P	3
TBOG3643	OG-7,2-75-3P	7,2 kV 75 kVAr 3 ph 3 bushings MV Capacitor	7,2	75	3P	3
TBOG3644	OG-7.2-100-3P	7.2 kV 100 kVAr 3 ph 3 bushings MV Capacitor	7,2	100	3P	3
TBOG3645	OG-7,2-125-3P	7,2 kV 125 kVAr 3 ph 3 bushings MV Capacitor	7,2	125	3P	3
TBOG3646	OG-7,2-150-3P	7,2 kV 150 kVAr 3 ph 3 bushings MV Capacitor	7,2	150	3P	3
TBOG3647	OG-7,2-200-3P	7,2 kV 200 kVAr 3 ph 3 bushings MV Capacitor	7,2	200	3P	3
TBOG3648	OG-7,2-250-3P	7,2 kV 250 kVAr 3 ph 3 bushings MV Capacitor	7,2	250	3P	3
TBOG3649	OG-7,2-300-3P	7,2 kV 300 kVAr 3 ph 3 bushings MV Capacitor	7,2	300	3P	3
TBOG3650	OG-7,2-400-3P	7,2 kV 400 kVAr 3 ph 3 bushings MV Capacitor	7,2	400	3P	3
TBOG3651	OG-7,2-500-3P	7,2 kV 500 kVAr 3 ph 3 bushings MV Capacitor	7,2	500	3P	3
TBOG3652	OG-7,2-600-3P	7,2 kV 600 kVAr 3 ph 3 bushings MV Capacitor	7,2	600	3P	3
TBOG3653	OG-7,2-660-3P	7,2 kV 660 kVAr 3 ph 3 bushings MV Capacitor	7,2	660	3P	3

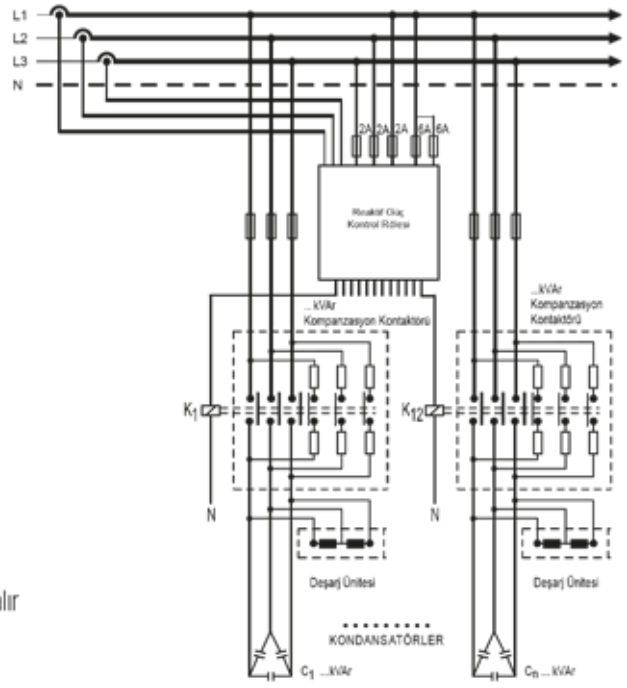
COMPENSATION CONTACTORS

TIBCON compensation contactors are specially designed to prevent high inrush currents. Our dual-stage contactors are equipped with a contact set and current-limiting resistors, providing protection against direct contact. These contactors cannot be operated manually, thereby ensuring both personnel safety and facility protection. If special contactors are not used, shock coils must be implemented. When the contactor coil is energized, the transition block contacts close first. After the initial inrush current of the capacitor flows through these contacts, they open shortly thereafter, and the nominal current of the capacitor begins to flow through the main contacts. In addition, when capacitors are first switched on, they can generate very short but extremely high inrush currents — reaching frequencies between 1 and 15 kHz and up to 150 times the nominal current. To balance and limit these currents, a pre-charging resistor can be added to each of the three phases connected to the capacitor. However, under normal conditions, this process is difficult and time-consuming. Therefore, specially designed compensation contactors are used specifically for this purpose. It acts as a control interface between the reactive power control relay and the capacitors. When compensation capacitors are switched into the circuit, they can cause disruptive effects. The inrush current of the switched capacitor reduces both its own lifespan and that of other capacitors in the circuit. The most effective way to eliminate these adverse effects is to use compensation contactors together with the capacitors. With the help of an auxiliary contact block, inrush currents are routed through damping resistors, keeping excessive currents within acceptable limits.

Technical Drawing

Connection Diagram

Connection Diagram
Bağlantı Şeması



SPECIFICATIONS:

- Auxiliary contact block
- Three-phase connection
- Supports capacitors up to 75 kVAr
- Coil voltage: 220–230 VAC, 50/60 Hz
- Compliant with IEC-60947
- Long electrical lifespan
- Operating voltage range: 220/240–400/440 V, 50/60 Hz

BENEFITS:

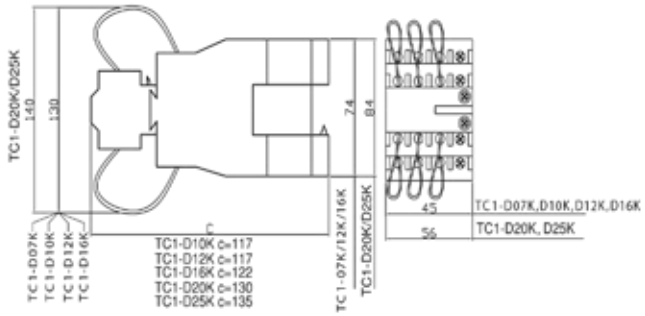
- Excellent suppression of inrush current
- Extended equipment lifespan
- Reduced maintenance and downtime
- Improved power quality
- Optimized solution cost
- Extends the lifespan of contacts
- Reduces the risk of reactive power penalties caused by contactor failures (compensation faults)
- Reduces capacitor failures
- Improves power quality by preventing voltage fluctuations
- Extends the maintenance interval of the compensation system and reduces unexpected failures, thereby minimizing production losses in industrial operations.

POWER FACTOR COMPENSATION CONTACTORS
TECHNICAL SPECIFICATIONS

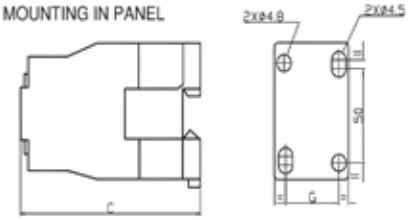
Order Code	Product Code	Product Description	Operating Power kVAr		Auxiliary Contacts		Operating Current (at 400V)	Max. Number of Operations per Hour	Switching Lifetime (Number of Operations)
			200V 240V	400V-440V	NO	NC			
TBK4000	TBC1D05K10M7	CONTACTOR 05K	2,8	5	1	1	7	240	200000
TBK4001	TBC1D10K02U7	CONTACTOR 10K	5,5	10	1	1	14	240	200000
TBK4002	TBC1D12K02U7	CONTACTOR 12K	6,7	12,5	1	1	18	240	200000
TBK4003	TBC1D16K02U7	CONTACTOR 16K	8,5	16,7	1	1	24	240	200000
TBK4004	TBC1D20K02U7	CONTACTOR 20K	10	20	1	1	29	240	200000
TBK4005	TBC1D25K02U7	CONTACTOR 25K	15	25	1	1	36	240	200000
TBK4006	TBC1D33K12U7	CONTACTOR 33K	20	33,3	1	1	48	240	150000
TBK4007	TBC1D40K12U7	CONTACTOR 40K	25	40	1	2	58	240	100000
TBK4008	TBC1D50K12U7	CONTACTOR 50K	30	50	1	2	73	100	100000
TBK4009	TBC1D60K12U7	CONTACTOR 60K	40	60	1	2	92	100	100000
TBK4010	TBC1D75K12U7	CONTACTOR 75K	45	75	1	2	108	100	100000

Technical Drawing
TEKNİK ÇİZİMİ

TBC-D05K, D10K, D12K, D16K, D20K, D25K



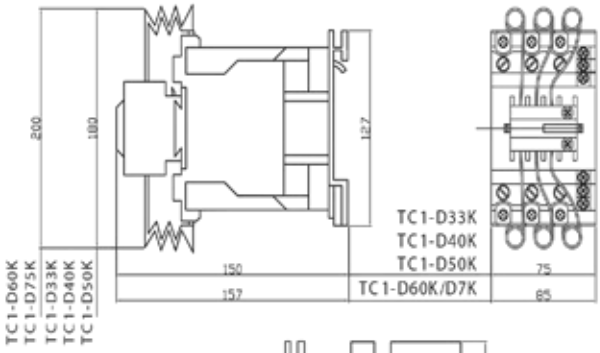
MOUNTING IN PANEL

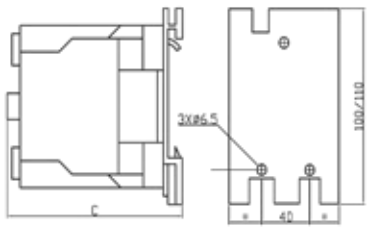


TC-1	D75K	D10K	D12K	D16K	D20K	D25K
C	80	80	80	85	93	98
G	35	35	35	35	40	40

Technical Drawing

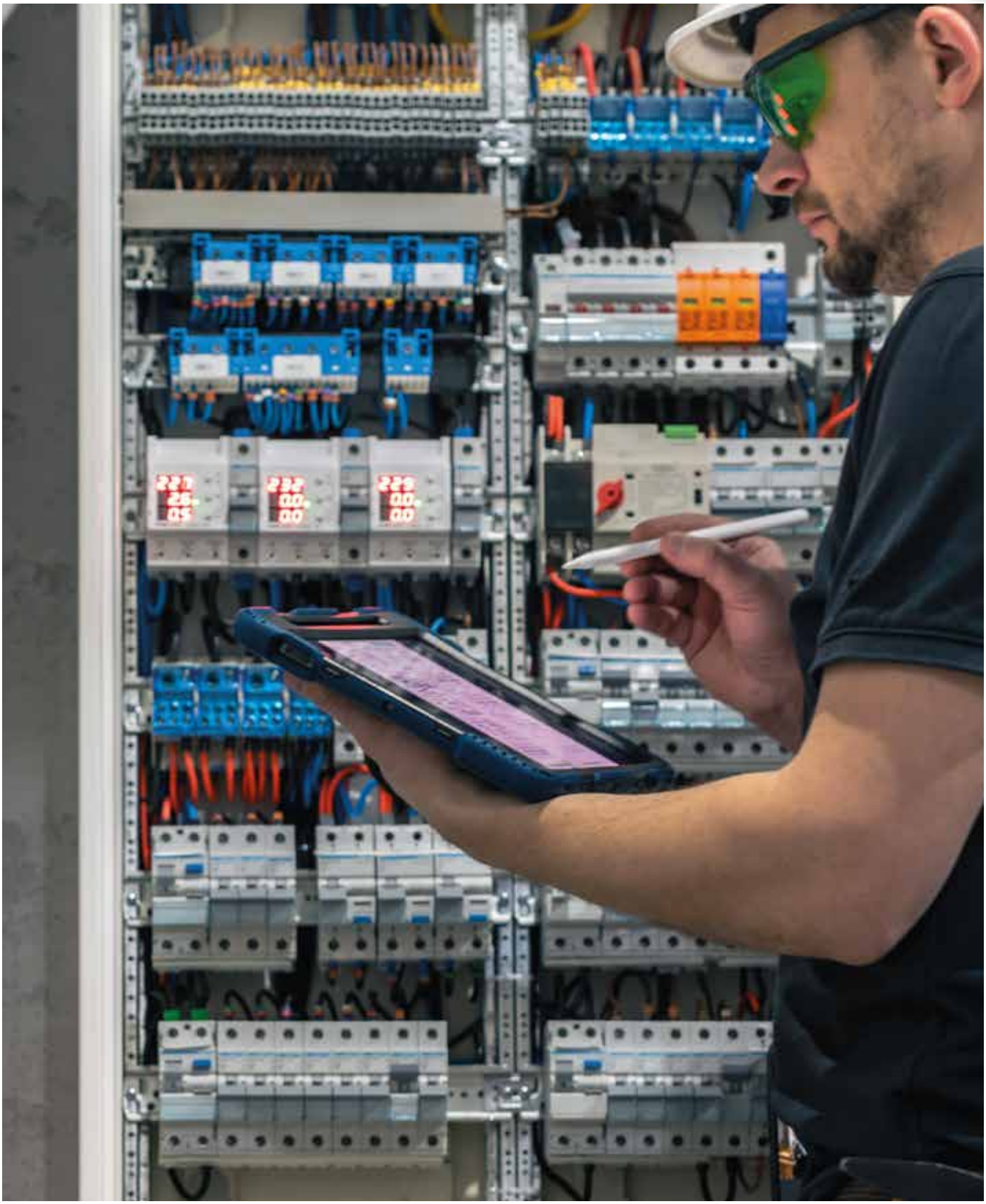
TBC-D33K, D40K, D60K, D75K





TC-1	D33K	D40K	D60K	D75K
C	114	114	125	125

TIBCON
ENERGY TECHNOLOGIES



COMPENSATION MEASUREMENT AND CONNECTION ACCESSORIES

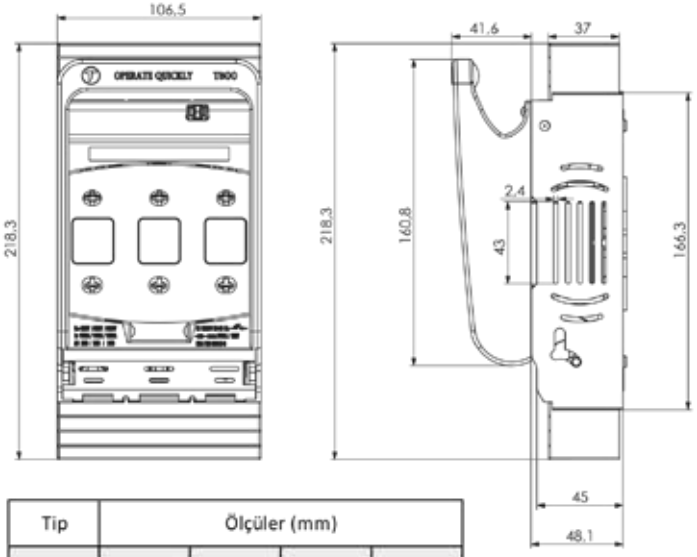
YATAY TİP YÜK AYRICI
GENEL ÖZELLİKLER

NH FUSED LOAD DISCONNECTOR (3-Pole)

TIBCON horizontal type load disconnectors are manufactured in accordance with IEC/EN 60947-3 standards. To ensure long-lasting durability, fused load disconnectors are produced using reinforced thermoplastic and flame-retardant materials. Blade fuse disconnect switches can be used both inside the panel and on the panel front. Thanks to the ability to change the blade fuses according to current draw and load variations, it is possible to protect the circuit at the desired rated current or operating class, allowing for versatile use of the same switch. Additionally, silver-plated contact features help reduce power loss.

MAIN FEATURES

- CE-compliant, manufactured according to IEC/EN 60947-3
- NH socket resistant to overheating tests
- Ergonomic and large grip surface
- Compact volume, easy mounting
- Wide safety clearance between fuse connections
- Modern and functional design
- Enhanced air discharge and circulation area
- Connection type: screw and nut connection (standard—suitable for cable and lerminal use)



Tip	Ölçüler (mm)			
TBC160	a	b	c	d
	106.5	89	218	205.7

TİP	TB00-160	TB01-250
Rated Thermal Current (Ith) A	160	250
Kutup Sayısı	3	3
Rated Insulation Voltage (Ui) V	750	750
Rated Impulse Withstand Voltage (Uimp) kV	8	8
Rated Frequency Hz	50-60	50-60
Operating Voltage (Ue) (faz-nötr) V	400	400
Utilization Category	AC23B	AC22B
Operational Current (Ie) A	160	250
Short-Circuit Breaking Capacity (with NH Fuse)	120	120
Fuse Type NH	0	1
Mechanical Life (Operations)	>20000	>20000
Electrical Life (Operations) mm2	200	200
Conductor Cross-Section (mm^2)	70	120
Power Loss Due to Contact Pressure	4	8
Min./Max. Tightening Torque (Nm)	7..10	14..20
Hole Diameter	M8	M10
Weight kg	0,7	1,51
Protection Class	IP20	IP20

KNIFE BLADE TYPE FUSES
GENERAL SPECIFICATION

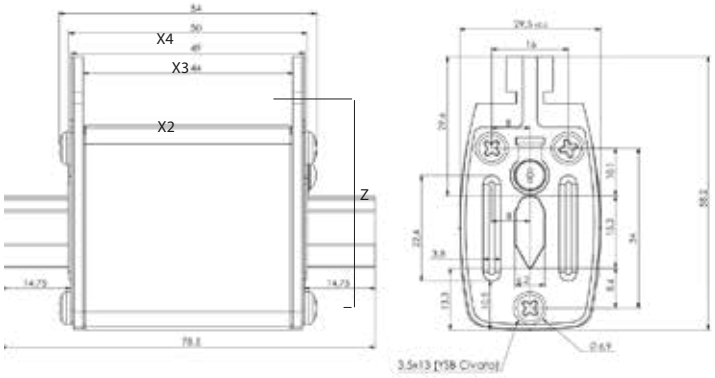
NH00-NH01 KNIFE BLADE TYPE FUSES

TIBCON NH fuse-links are engineered to deliver exceptionally low power loss and a very high short-circuit breaking capacity, ensuring maximum safety and efficiency in electrical systems. Designed for durability and operational reliability, these fuses perform consistently under a wide range of temperature conditions and can withstand short-term overcurrents without affecting the accuracy of their characteristic curves. Only high-purity quartz sand, with precise grain size distribution and optimal density, is used to guarantee safe arc quenching and prevent internal damage.

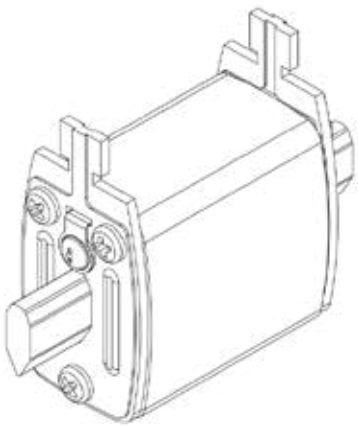
In addition, TIBCON blade-type fuses, manufactured from high-quality steatite ceramic, offer outstanding performance in demanding applications. With a rated voltage of 500V AC, current ratings up to 160A, and the ability to interrupt short-circuit currents up to 120 kA (rms), they provide robust protection for critical components such as transformers, cables, switches, and distribution panels against overloads and short circuits.

MAIN FEATURES

- Compliant with IEC 60269-1 and IEC 60269-2 standards, CE certified
- Operating characteristic: Super quick (fast acting)
- Rated voltage: 500 V AC
- Utilization category: Gr
- Breaking capacity: 120 kA (rms)



Tip Type	Dimensions/ÖLÇÜLER								
	X1	X2	X3	X4	Y	Z	D1	D2	D3
TB-NH00	78,5	54	45	50	15	58	48	29,5	45
TB-NH01	135	72,6	62	68	20	64	52	46	50



Order Code	Product Code	Rated Current (In) (A)	Breaking Capacity (Ka)	Rated Voltage Un (V)	Rated Insulation Level (V)	Operating Frequency (Hz)
TBNH4200	TB-NH00-16	16	120	500	690	50-60
TBNH4201	TB-NH00-25	25	120	500	690	50-60
TBNH4202	TB-NH00-32	32	120	500	690	50-60
TBNH4203	TB-NH00-40	40	120	500	690	50-60
TBNH4204	TB-NH00-50	50	120	500	690	50-60
TBNH4205	TB-NH00-63	63	120	500	690	50-60
TBNH4206	TB-NH00-80	80	120	500	690	50-60
TBNH4207	TB-NH00-100	100	120	500	690	50-60
TBNH4208	TB-NH00-125	125	120	500	690	50-60
TBNH4209	TB-NH00-160	160	120	500	690	50-60
TBNH4210	TB-NH01-160	160	120	500	690	50-60
TBNH4211	TB-NH01-200	200	120	500	690	50-60
TBNH4212	TB-NH01-250	250	120	500	690	50-60

REACTIVE POWER CONTROL RELAY

GGENERAL SPECIFICATIONS

REACTIVE POWER CONTROL RELAY

The TET Series Reactive Power Control Relays are innovative devices developed through extensive efforts by our expert R&D team, specializing in power quality and compensation applications. These relays are designed in three versions: classic, SVC-supported, and thyristor-triggered, to meet the diverse needs of modern compensation systems.

Engineered for three-phase electrical systems, they are developed to minimize reactive power in facilities that comply with compensation regulations. With the support of SVC technology, the TET Series achieves maximum efficiencyusing a minimum number of steps, especially in the compensation of unbalanced loads. In addition, the relays are equipped to measure electrical parameters in real time and offer alarm functions to protect the system.

With a wide supply voltage range of 100–265 V AC, a compact ergonomic design (144x144x68 mm), and a variety of advanced features, the TET Series delivers both high performance and smart design in a single, reliable solution.

- 128x64 Graphic LCD Display
- Easy use with Turkish & English menus
- RS-485 communication (Modbus RTU)
- TCR (SVC) output connection
- Real-time clock
- Event and log recording
- Individual Harmonic Analysis (2–31, HD-I and HD-V)
- Monitoring of: V, A, P, Q, S, PF, Cosϕ, LP, LQ, LS, THD-I, THD-V
- Import and export energy monitoring
- Supports inductive and capacitive system compensation
- Generator input, energy recording, and compensation (Cos2)
- Supports single-phase, two-phase, or three-phase capacitor or shunt reactor connections
- Manual step value input
- Monitoring of monthly, weekly, daily, hourly, and total compensation ratios
- Adjustable alarm output for electrical and compensation parameters
- Built-in buzzer
- Adjustable step-in, release, discharge, and switching times
- Step suggestion and equal aging of steps
- Monitoring of cosϕ and energy values for each phase

Order Code	Product Code	Product Description	Dimensions (mm)	Number of steps	Graphic LCD screen (128*64)	1-2-3 Phase Capacitor	1-2-3 Phase Shunt Capacitor	TSC-Thyristor Triggering	TSC-TRİSÖTR TETİKLEME	Jeneratör	Generator Mode (Cos2)	Cosϕ	RS-485 Communication	Step Recommendation	Panel Temperature Control	1x Alarm Output	1x Panel Fan Output	2–36 Harmonics	Built-in Buzzer	THD-I THD-V
TBE2700	TET-12+3 SVC	REACTIVE POWER CONTROL RELAY-RG-12 SVC	144 x 144	12+SVC	•	•	•	•		•	•	•	•	•		•		•	•	•
TBE2701	TET-15 K	REACTIVE POWER CONTROL RELAY-RG-15-K	144 x 144	15	•	•	•			•	•	•	•	•		•		•	•	•
TBE2702	TET-15+3 SVC	REACTIVE POWER CONTROL RELAY-RG-15-SVC	144 x 144	15+SVC	•	•	•	•		•	•	•	•	•		•		•	•	•
TBE2704	TET-18 +3 SVC	REACTIVE POWER CONTROL RELAY-RG-18-SVC	144 x 144	18+SVC	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•
TBE2705	TET-18 T SVC	REACTIVE POWER CONTROL RELAY-RG-18 T SVC	144 x 144	18+SVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

TET-15A / 18A SERIES REACTIVE POWER CONTROL RELAYS

HIGH PERFORMANCE SOLUTION FOR MV, LV & PV APPLICATIONS

TIBCON SVC MV(MEDIUM VOLATGE)-LV(LOW VOLATGE)-SES(SOLAR ENERGY SYSTEM)

Current-Referenced Compensation System

TIBCON SVC OG-AG-GES is an advanced compensation system that receives current data from either low voltage (LV) or medium voltage (MV) levels, while the compensation elements are located on the LV side. It enables current-referenced operation from both MV and LV via a single reactive power control relay. Current is measured via current transformers, while voltage is directly supplied from the LV side.

The system analyzes each phase independently by considering phase angle differences. Compensation steps and SVC modules are activated with high precision. After commissioning, fine-tuning can be performed on a per-phase basis via the relay menu using meter and relay observations, ensuring optimal compensation.

Smart and Powerful Solution for PV Plants

In solar power plants (PV), reactive power demand arises at night due to internal consumption and power transformers, while active consumption is low. This may lead to exceeding reactive limits and penalties. The Tibcon MV-LV-SES relay ensures accurate compensation of such loads, preserving power quality and preventing penalties or imbalances.

Regardless of whether the metering subscription is at LV or MV level, the system supports both production and consumption simultaneously. TET-15A / TET-18A relays continuously monitor the production-consumption balance, ensuring proper compensation and system stability.

Dynamic Monitoring and Fast Response

When designing compensation systems for solar plants, day and night conditions must be evaluated separately. The Tibcon system continuously monitors energy flow direction and quickly performs necessary interventions through its connected steps and SVC modules.

This dynamic structure ensures optimal performance during both production and consumption periods.

Order Code	Product Code	Product Description	Dimensions (mm)	Number of steps	Graphic LCD screen (128*64)	1-2-3 Phase Capacitor	1-2-3 Phase Shunt Capacitor	TSC-Thyristor Triggering	LV Reference	MV Reference	Generator	Generator Mode (Cos2)	Cosφ	RS-485 Communication	Step Recommendation	Panel Temperature Control	1x Alarm Output	1x Panel Fan Output	2–36 Harmonics	Built-in Buzzer	THD-I THD-V
TBE2703	TET-15A SVC	TET 15A SVC OG GES RELAY	144 x 144	15+SVC	•	•	•	•	•	•	•	•	•	•	•		•		•	•	•
TBE2708	TET-18A SVC	TET 18A SVC OG GES RELAY	144 x 144	18+SVC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

REACTIVE POWER CONTROL RELAY
TECHNICAL FEATURES

Technical Data	TET-12+3 SVC	TET-15K	TET-15+3 SVC	TET-15A SVC	TET-18+3 SVC	TET-18 T SVC	TET-18A SVC+OG
Number of steps	12+SVC	15	15+SVC	15+SVC	18+SVC	18+SVC	18+SVC
Operating voltage	100- 265 Vac	100- 265 Vac	100- 265 Vac	100- 265 Vac	100- 265 Vac	100- 265 Vac	100- 265 Vac
Operating frequency	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz
Current measurement range	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A
Voltage measurement range	5-300 V AC (L-N) 10-520 V AC (L-L)	5-300 V AC (L-N) 10-520 V AC (L-L)	5- 300 V AC (L-N) 10- 520 V AC (L-L)	5- 300 V AC (L-N) 10- 520 V AC (L-L)	5- 300 V AC (L-N) 10- 520 V AC (L-L)	5- 300 V AC (L-N) 10- 520 V AC (L-L)	5- 300 V AC (L-N) 10- 520 V AC (L-L)
Frequency	OK	OK	OK	OK	OK	OK	OK
Cosϕ	OK	OK	OK	OK	OK	OK	OK
%THD-V / %THD-I	OK	OK	OK	OK	OK	OK	OK
Active power	OK	OK	OK	OK	OK	OK	OK
Reactive power	OK	OK	OK	OK	OK	OK	OK
Active energy	OK	OK	OK	OK	OK	OK	OK
Reactive energy	OK	OK	OK	OK	OK	OK	OK
Apparent energy	OK	OK	OK	OK	OK	OK	OK
AG / OG	AG	AG	AG	OG/GES	AG	AG	OG/GES
Shunt reactor	OK	OK	OK	OK	OK	OK	OK
TCR	OK		OK	OK	OK	OK	OK
TSC						OK	
Single-phase capacitor	OK	OK	OK	OK	OK	OK	OK
Three-phase capacitor	OK	OK	OK	OK	OK	OK	OK
Overvoltage protection	OK	OK	OK	OK	OK	OK	OK
Undervoltage protection	OK	OK	OK	OK	OK	OK	OK
Over-temperature protection	OK	OK	OK	OK	OK	OK	OK
Temperature control					OK	OK	OK
Generator	OK	OK	OK	OK	OK	OK	OK
Generator Cosϕ2	OK	OK	OK	OK	OK	OK	OK
Generator energy record	OK	OK	OK	OK	OK	OK	OK
Graphic LCD	128x64	128x64	128x64	128x64	128x64	128x64	128x64
Individual harmonics	36	36	36	36	36	36	36
RS-485 communication	OK	OK	OK	OK	OK	OK	OK
Alarm output	1200- 19200	1200- 19200	1200- 19200	1200- 19200	1200- 19200	1200- 19200	1200- 19200
Offset adjustment (3-phase)	OK	OK	OK	OK	OK	OK	OK
Cosϕ adjustment	OK	OK	OK	OK	OK	OK	OK
Step-on time	OK	OK	OK	OK	OK	OK	OK
Step-off time	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn
Discharge time	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn
Response time	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn	1- 60 sn
Protection class	100 ms- 5sn	100 ms- 5sn	100 ms- 5sn	100 ms- 5sn	100 ms- 5sn	100 ms- 5sn	100 ms- 5sn
Dimensions (mm)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Ön Panel) IP20 (Gövde)	IP54 (Ön Panel) IP20 (Gövde)	IP54 (Ön Panel) IP20 (Gövde)
Buzzer	144x144	144x144	144x144	144x144	144x144	144x144	144x144

TIBCON
ENERGY TECHNOLOGIES

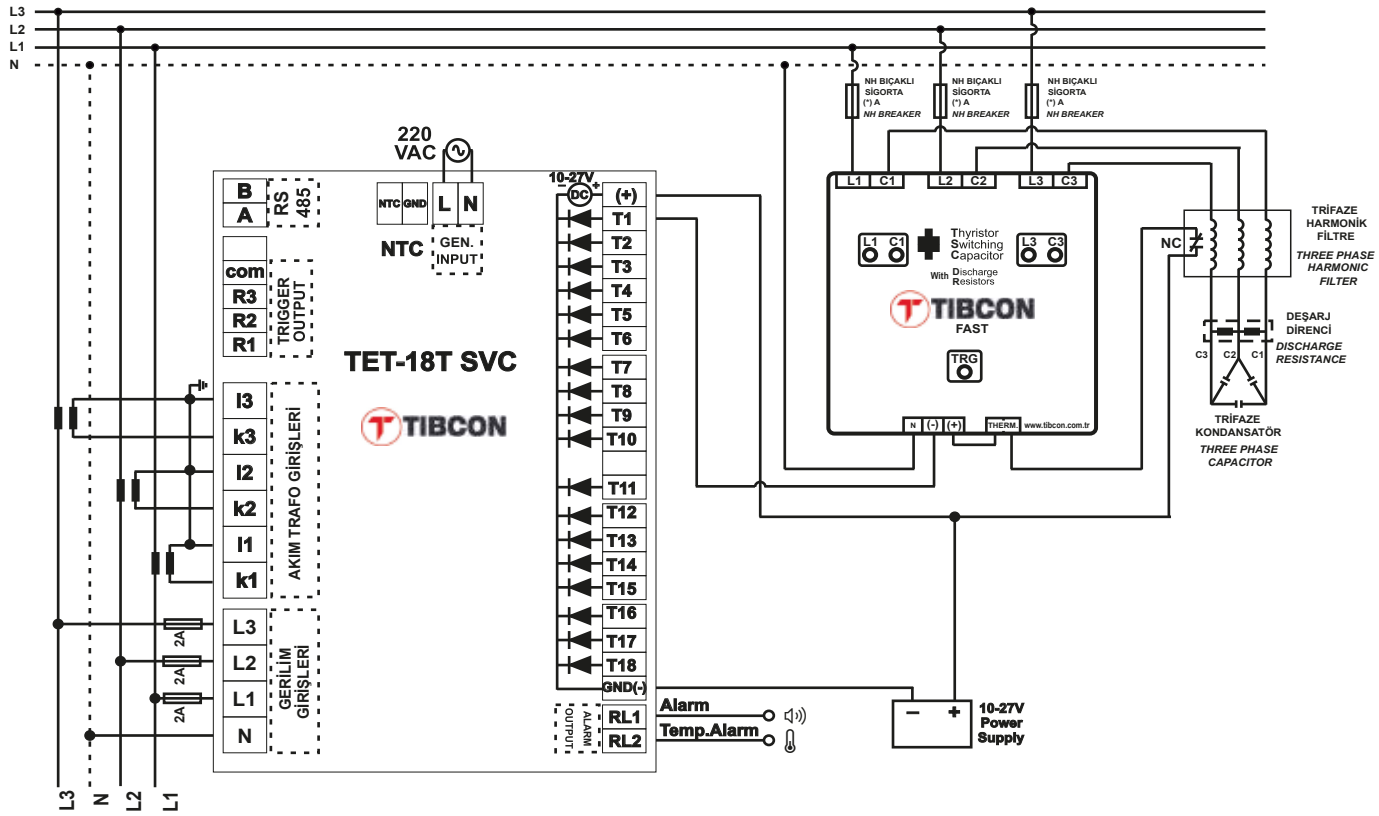
REACTIVE POWER CONTROL RELAY

TECHNICAL SPECIFICATIONS TABLE

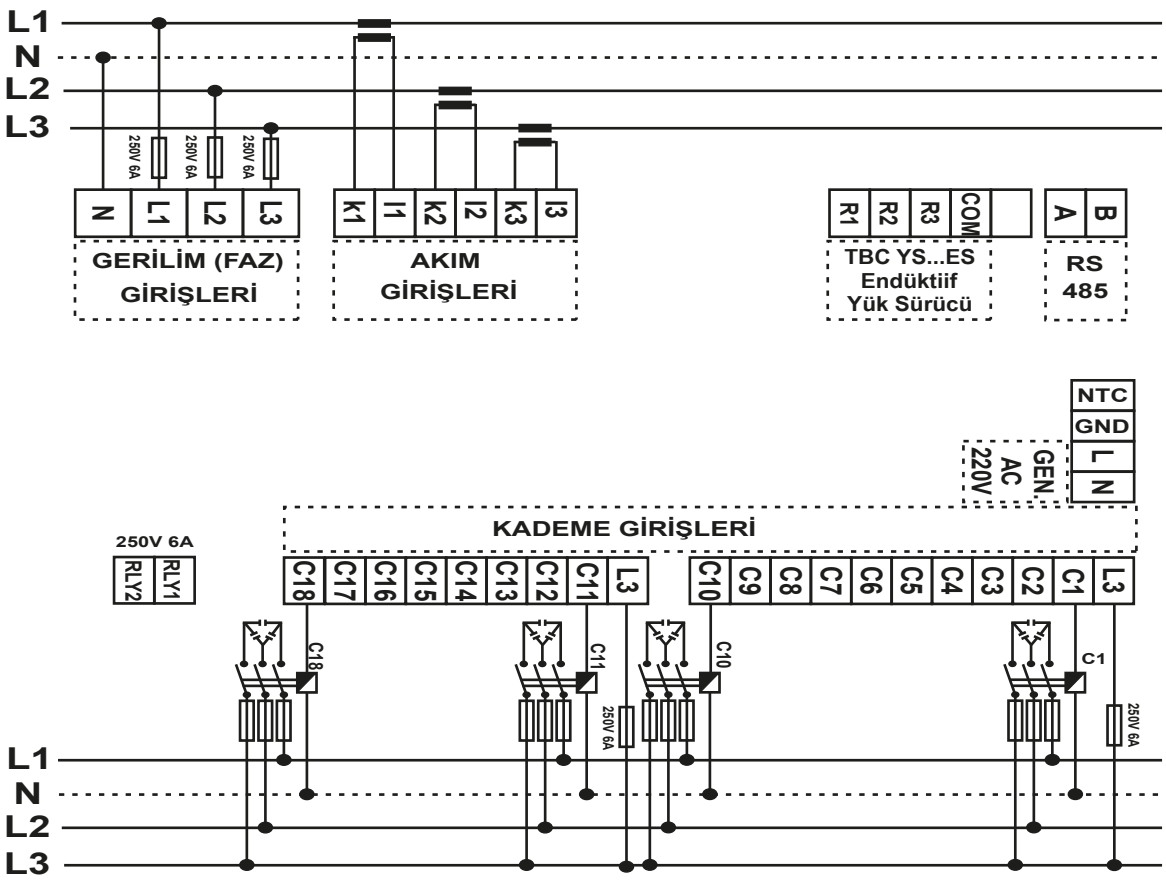
Operating Voltage	100V – 265 V AC
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	45 – 65 Hz.
Power Consumption	3 – 11 VA
Input Power Consumption (Measurement)	< 0,5 VA
Current Measurement Range	1 mAAC – 5,5 AAC
Voltage Measurement Range	5 – 300 VAC (L-N)
	10 – 520 VAC (L-L)
CT Ratio	8000 / 5
Measurement Accuracy	
Voltage	%0,50
Current	%0,50
Frequency	%0,10
Cosφ	%0,20
Active Energy	%1
Reactive Energy	%2
Relay Output	NO Max 5 AAC 250 VAC Cosφ=1
Communication	Modbus RTU, Optically Isolated, Programmable
Baudrate (bps)	1200, 2400, 4800, 9600, 14400, 19200
Address (ID)	1 – 247
Harmonics	2 – 31
Protection Class	IP54 (Front Panel)
	IP20 (Enclosure)
Device Insulation Class	Double Insulation
Operating Temperature	-25°C ……+70°C
Humidity	Maksimum %90
Operating Altitude	<2000 m
Mounting Type	Front panel mounting
Connection Type	3P4W (Star)
IK Code	IK06
Cable Section (Supply Terminal)	Max 2,5 mm²
Cable Section (Voltage Terminal)	Max 2,5 mm²
Cable Section (Current Terminal)	Max 2,5 mm²
Cable Section for RS485	Max 2,5 mm²
Weight	570 gr
Dimensions	144 x 144 x 68 mm
Panel Cutout Dimensions	137x137 mm

REACTIVE POWER CONTROL RELAY
BAĞLANTI ŞEMALARI

TET 18T SVC CONNECTION DIAGRAM



TET 12-15-18-24 SVC CONNECTION DIAGRAM



ENERGY ANALYZER
GENERAL FEATURES

Order Codes	Product Code	Product Descriptions	Dimensions (mm)	Operating Voltage	Trend Parameters (Current, Voltage, Frequency)	Graphic LCD Display (128*64)	7 Segment LED Display (14mm)	3x Cosϕ	Power Factor (PF1,PF2,PF3)	Demand - Max Demand	Sag/Swell	2-51st Harmonic Measurement	THD-I, THD-V	RS-485 Modbus Communication	2 Relay Outputs	Alarm Modes	Clock/Date Function
TBE2200	EA-01	BASIC MODEL ENERGY ANALYZER WITH COMMUNICATION	96x96	45- 265 Vac/dc	•	•		•		•	•	•		•			
TBE2201	EA-03	ADVANCED MODEL ENERGY ANALYZER WITH COMMUNICATION	96x96	45- 265 Vac/dc	•	•				•	•	•	•	•	•	•	•
TBE2202	EA-11	DIGITAL ENERGY ANALYZER	96x96	45- 265 Vac/dc	•		•	•		•	•	•	2-51				
TBE2203	EA-12	DIGITAL ENERGY ANALYZER WITH COMMUNICATION	96x96	45- 265 Vac/dc	•		•	•		•	•	•	2-31	•			
TBE2204	EA-13	DIGITAL ENERGY ANALYZER WITH COMMUNICATION & CONTACT OUTPUT	96x96	45- 265 Vac/dc	•		•	•	•	•	•	•	2-31	•	•	•	

Our EA Series Energy Analyzers are developed by our expert R&D team in power quality to measure all electrical network parameters, calculate consumed energy, protect the system with alarm options, control it, and display all measured parameters.

With a wide power supply range of 45-265V AC/DC, compact dimensions of 96x96x51 mm, and standard RS-485 communication (Modbus RTU) across the entire series, these devices offer both design and efficiency.

MEASURED PARAMETERS

- 128*64 Wide Graphic LCD Display
- User-friendly menu in Turkish & English
- RS-485 Communication (Modbus RTU)
- Configurable relay outputs
- Adjustable digital inputs/outputs
- Real-time clock
- Event and log records
- Sag/Swell detection
- Individual Harmonics (Up to 31st & 51st)
- V, A, P, Q, S, PF, Cosϕ, LP, LQ, LS, THD-I, THD-V
- Import & Export Energies
- Min, Max, and Demand readings

APPLICATION PURPOSES

- Electrical network parameter analysis
- Over/under limit alarms for parameters
- Energy index measurement for systems
- Harmonic analysis
- Compensation system analysis
- Network statistics tracking
- Communication-enabled grid systems

ENERGY ANALYZER
FEATURES TABLE

Product Code	EA-01	EA-03	EA-11	EA-12	EA-13
Operating Voltage	45-265 V AC/DC	45-265 V AC/DC	45-265 V AC/DC	36-265 V AC/DC	36-265 V AC/DC
Operating Frequency	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz	45- 65 Hz
Current Measurement Range	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A	1mA- 5,5 A
Voltage Measurement Range	5- 300 V AC (L-N)	5- 300 V AC (L-N)	5- 300 V AC (L-N)	5- 300 V AC (L-N)	5- 300 V AC (L-N)
	10- 520 V AC (L-L)	10- 520 V AC (L-L)	10- 520 V AC (L-L)	10- 520 V AC (L-L)	10- 520 V AC (L-L)
Frequency	OK	OK	OK	OK	OK
Cos	OK	OK	OK	OK	OK
Power Factor	R,S,T,ΣPF	R,S,T,ΣPF	R,S,T,ΣPF	R,S,T,ΣPF	R,S,T,ΣPF
Neutral Current	OK	OK	OK	OK	OK
Max/Min Voltage	OK	OK	OK	OK	OK
Demand-Max Demand	OK	OK	OK	OK	OK
Active Energy Class 0.5	-	-	OK	OK	OK
Active Energy Class 1	OK	OK	-	-	-
Reactive Energy Class 2	OK	OK	OK	OK	OK
Active Power	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP	P1, P2, P3, ΣP
Reactive Power	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ	Q1, Q2, Q3, ΣQ
Apparent Power	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS	S1, S2, S3, ΣS
Over/Under Voltage Protection	-	OK	-	-	OK
Over/Under Current Protection	-	OK	-	-	OK
Over/Under Frequency Protection	-	OK	-	-	OK
Over Neutral Current Protection	-	OK	-	-	OK
Voltage Imbalance	-	OK	-	-	OK
Current Imbalance	-	OK	-	-	OK
Phase Sequence/Phase Loss Protection	-	OK	-	-	OK
% THD-V	OK	OK	OK	OK	OK
% THD-I	OK	OK	OK	OK	OK
Sag / Swell	OK	OK	-	-	OK
Individual Harmonics	-	51	-	31	31
Digital Input	-	-	-	-	-
Digital Output	-	-	-	-	-
Clock (RTC)	-	OK	-	-	-
Sampling per Period	128	128	128	128	128
Event Records	-	-	-	-	-
Log Records	-	-	-	-	-
RS-485 Communication	OK	OK	-	OK	OK
Connection	3P3W, 3P4W 3P3W ARON	3P3W, 3P4W 3P3W ARON	3P3W / 3P4W	3P3W / 3P4W	3P3W / 3P4W
Protection Class	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)
Relay Output	-	2 NO Contacts Max 5A AAC 250 VAC Cosϕ=1	-	-	2 NO Contacts Max 5A 250 VAC Cosϕ=1
Display Options	Graphic LCD (128*64)	Graphic LCD (128*64)	7-Segment LED	7-Segment LED	7-Segment LED
Operating Temperature	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C	-25°C....70°C
Dimensions	96x96 mm	96x96 mm	96x96 mm	96x96 mm	96x96 mm

ENERGY ANALYZER
TECHNICAL SPECIFICATIONS

Operating Voltage	45 – 265 VAC / DC ±%10
Operating Range	Un x (0,9 – 1,1)
Operating Frequency	30 – 100 Hz.
Power Consumption	3 – 6 VA
Measurement Input Power Consumption	< 0,5 VA
Voltage Measurement Range	1 mAAC – 5,5 AAC
Current Measurement Range	5 – 300 VAC (L-N)
	10 – 520 VAC (L-L)
Current Transformer Ratio	1 – 2000 (10000/5)
Voltage Transformer Ratio	1.0 – 4000.0
Optional	
Digital Input Active Level	6 – 30 VDC
Digital Output Active Level	6 – 30 VDC
Measurement Accuracy:	
Voltage	%0,5
Current	%0,5
Frequency	%0,1
Cosφ	%0,2
Active Energy	%1 (EA-01, EA-02), %0,5 (EA-11, EA-12, EA-13)
Reactive Energy	%2 (EA-01, EA-02), %1 (EA-11, EA-12, EA-13)
Relay Output	2 Adet NO Max 5 AAC 250 VAC Cosφ=1
Communication	Modbus RTU, Optically Isolated, Programmable
Baudrate (bps)	1200, 2400, 4800, 9600, 14400, 19200
Stop Bits	(1), (1,5), (2)
Parity Bit	Default is None (Not Changable)
Adres (ID)	1 – 247
Harmonics	2 – 31 (EA-02)
	2 – 51 (EA-11, EA-12, EA-13)
Protection Class	IP54 (Front Panel)
	IP20 (Enclosure)
Device Protection Class	Double Insulation
Operating Temperature	-25°C ……+70°C
Humidity	Maximum %90
Operating Altitude	<2000 m
Mounting Method	Front Panel Mount
Connection Type	3P3W (Delta), 3P4W (Star)
Cable Code	IK06
Power Supply Terminal	Max 2,5 mm²
Voltage Terminal	Max 2,5 mm²
Current Terminal	Max 2,5 mm²
RS485, DI, DO	Max 1,5 mm²
Weight	238 gr
Dimensions	96 x 96 x 51 mm
Panel Cut-Out Dimensions	92 x 92 mm
Standards	TS EN 61000-4-2 TS EN 61000-4-5 TS EN 61000-4-6
	TS EN 61000-4-3 TS EN 61000-4-4 TS EN 61000-3-3
	TS EN 61000-4-11 TS EN 61000-4-8 TS EN 61010-1
	TS EN 55011
EU Directives	2014 / 35 / EU (LVD)
	Directive 2014 / 30 / EU (EMC)

MM SERIES MULTIMETER
GENERAL FEATURES

Order Codes	Product Code	Product Descriptions	Dimensions (mm)	Operating Voltage	Current Measurement Range	Class	Basic Parameters (Current-Voltage-Frequency)	Graphic LCD Display (128*64)	RS-485 Communication	7 Segment LED Display (14mm)	2 Relay Outputs	Neutral Current Display	Apparent Power (S1,S2,S3,SΣ)	Demand- Max Demand	X/5	CT (3 Faz)
TBE2600	MM-01	MULTIMETER	96x96	45-265V AC/DC	0,05-5,5	0,2	•			•		•	•	•	•	•
TBE2601	MM-02	MULTIMETER WITH LCD DISPLAY	96x96	45-265V AC/DC	0,05-5,5	0,2	•	•	•		•	•	•	•	•	•

Our MM Series Multimeters are developed by our expert R&D team in the field of Power Quality and Energy Solutions. Designed for 3-phase electrical systems to measure current, voltage, frequency, apparent power, min/max voltages, current demand, and maximum current demand while also protecting the system with alarm options.

With a 45-265V AC/DC wide input range and compact 96x96x51 mm size, these advanced models offer exceptional performance and functionality.

- 4x4 Digit 14mm Digital LED Display
- Easy-to-use menu navigation
- Over/Under Voltage, Current, Frequency Protection
- Phase-to-Phase or Phase-to-Neutral Protection
- Phase Sequence Error Information & Protection
- 3-Phase L-N and L-L Voltage Display
- 3-Phase Current and Frequency Display
- Adjustable Relay Outputs
- V, A, S, and LS Parameter Monitoring
- RS-485 Communication (Modbus RTU)
- Min, Max, and Demand Readings
- Connection Information (Δ)

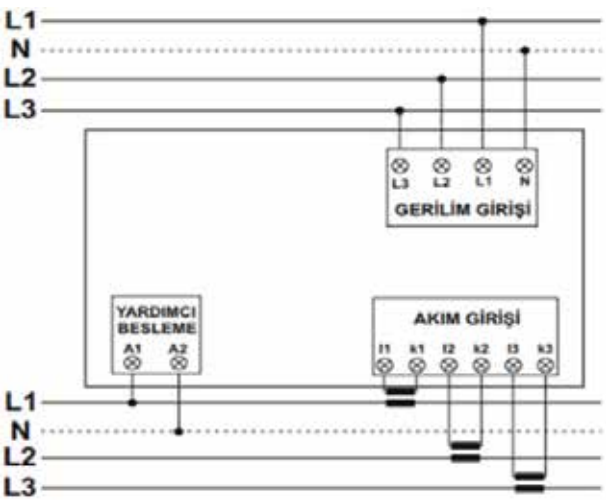
SPECIFICATIONS

- Operating voltage: 180-240 VAC
- Operating Frequency: 50 Hz
- Çalışma sıcaklığı;-10, +55 °C
- Power Consumption: <4 VA
- Current Measurement Range: 5-4000 A
- Voltage Measurement Range: 5 VAC – 40 kV
- Mounting: Front Panel Mount
- Terminal Type: Plug-in Terminals
- Cable Diameter: Voltage – 1 mm², Current – 2.5 mm²
- Panel Cut-Out: 91x91 mm

Technical Label Explanation:

A1 – A2 …… Auxiliary Power Supply Input
N: …… Neutral Input
L 1: …….. Voltage Inputs for Phases 1
L 2: ..... Voltage Inputs for Phases 2
L 3: ..... Voltage Inputs for Phases 3
⧈ ..... Double Insulation Symbol
Un: ..... Device Supply Voltage Range
Fr: ..... Device Operating Frequency Rang

CONNECTION DIAGRAM



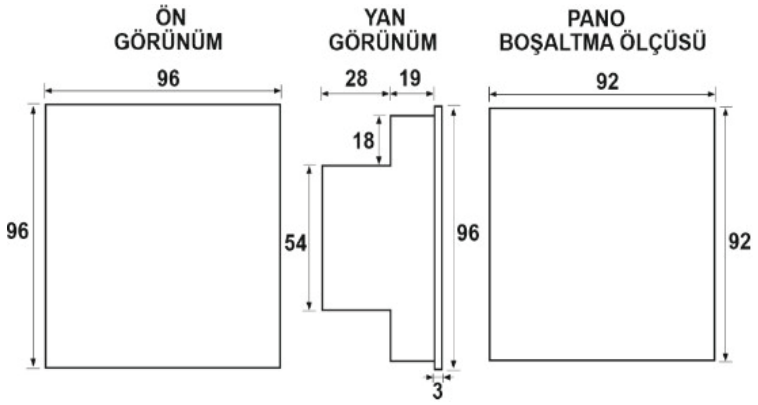
k 1: ..... Current Inputs for Phases 1
l 1: ..... Current Outputs for Phases 1
k 2: ..... Current Inputs for Phases 2
l 2: ..... Current Outputs for Phases 2
k 3: ..... Current Inputs for Phases 3
l 3: ..... Current Outputs for Phases 3

TIBCON
ENERGY TECHNOLOGIES

MM SERIES MULTIMETER
TECHNICAL SPECIFICATIONS

Product Code	MM-01	MM-02
Operating Voltage	45-265 V AC/DC	45-265 V AC/DC
Operating Frequency	45 - 65 Hz.	45 - 65 Hz.
Current Transformer Ratio	1...2000	1...2000
Voltage Transformer Ratio	0,1...4000,0	0,1...4000,0
Current Measurement Range	0,05 - 5,5 A AC	0,05 - 5,5 A AC
Voltage Measurement Range	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)	10 - 300 Vac (L-N) 20 - 520 Vac (L-L)
Frequency		+
Cosϕ	-	-
Neutral Current	-	-
Max-Min Voltage	√	+
Demand-Max Demand	√	+
Active Energy	-	-
Reactive Energy	-	-
Apparent Power	S1, S2, S3, SΣ	S1, S2, S3, SΣ
Over /Under Voltage Protection	-	√
Over /Under Current Protection	-	√
Over /Under Frequency Protection	-	√
Over Neutral Current Protection	-	-
Voltage Imbalance Protection	-	√
Current Imbalance Protection	-	√
Phase Sequence/ Phase Loss Protection	-	√
Instant Switching (Current / Voltage)	-	-
Resetable Total Operation Clock	-	-
RS-485 Communication	-	√
Protection Class	IP54 (Front Panel) IP20 (Enclosure)	IP54 (Front Panel) IP20 (Enclosure)
2 Contact Output	-	Max 5A 250 Vac Cosϕ=1
Display Options	4x4 14mm LED Display	LCD (128x64)
Operating Temperature	-25°C...70°C	-25°C...70°C
Dimensions (mm)	96x96	96x96

DEVICE DIMENSIONS AND PANEL CLEARANCE DIMENSIONS



INDUCTIVE LOAD DRIVERS (SVC)

GENERAL SPECIFICATIONS

Order Code	Product Code	Operating Voltage	Max. Connectable Shunt Reactor Power	Dimensions (mm) (Width-Height-Depth)	Nominal Fuse Current (A)	Fan Protection	Response Time	Nominal Cable Size (mm^2)
TBE2100	TBC-YS-5 ES	230V 50 Hz	3x1,66 kVAr	82x105x65	16		20ms	3(1x2,5)
TBE2101	TBC-YS-10 ES	230V 50 Hz	3x3,33 kVAr	90x105x80	25		20ms	3(1x2,5)
TBE2102	TBC-YS-20 ES	230V 50 Hz	3x6,67 kVAr	126x165x150	50	•	20ms	3(1x10)
TBE2103	TBC- YS-30 ES	230V 50 Hz	3x10 kVAr	126x165x150	80	•	20ms	3(1x16)
TBE2104	TBC- YS-50 ES	230V 50 Hz	3x16,67 kVAr	155x280x210	125	•	20ms	3(1x25)
TBE2105	TBC- YS-60 ES	230V 50 Hz	3x20 kVAr	155x265x207	160	•	20ms	3(1x35)

Inductive Load Drivers (SVC)

Inductive load drivers are switching devices that connect to each phase and control monophase shunt reactors proportionally, enabling precise compensation even at low power levels. SVC load drivers are designed to drive 3 monophase shunt reactors. Each reactor is connected to a separate phase and controlled independently to supply the required power. By triggering thyristors at specific angles, the load driver can adjust power in 1000 steps per phase, for a total of 3000 steps, achieving precise control.

In compensation systems where capacitors are switched via contactors, switching currents can reach up to 200 times the rated current (IN), shortening the life of both contactors and capacitors. Inductive load drivers with capacities of 5, 10, 20, 30, 50, and 60 kVAr switch shunt reactors connected to phases as needed, responding very quickly (20 ms) even to very low loads. The cooling and fan system in the design prevent overheating and ensure reliable triggering and connection.

- When switching shunt reactors with SVC, NH fuses or type C circuit breakers are recommended.
- For higher power applications, up to 3 parallel drivers can be connected. (Contact us for more than 3 SVC + shunt reactors.)

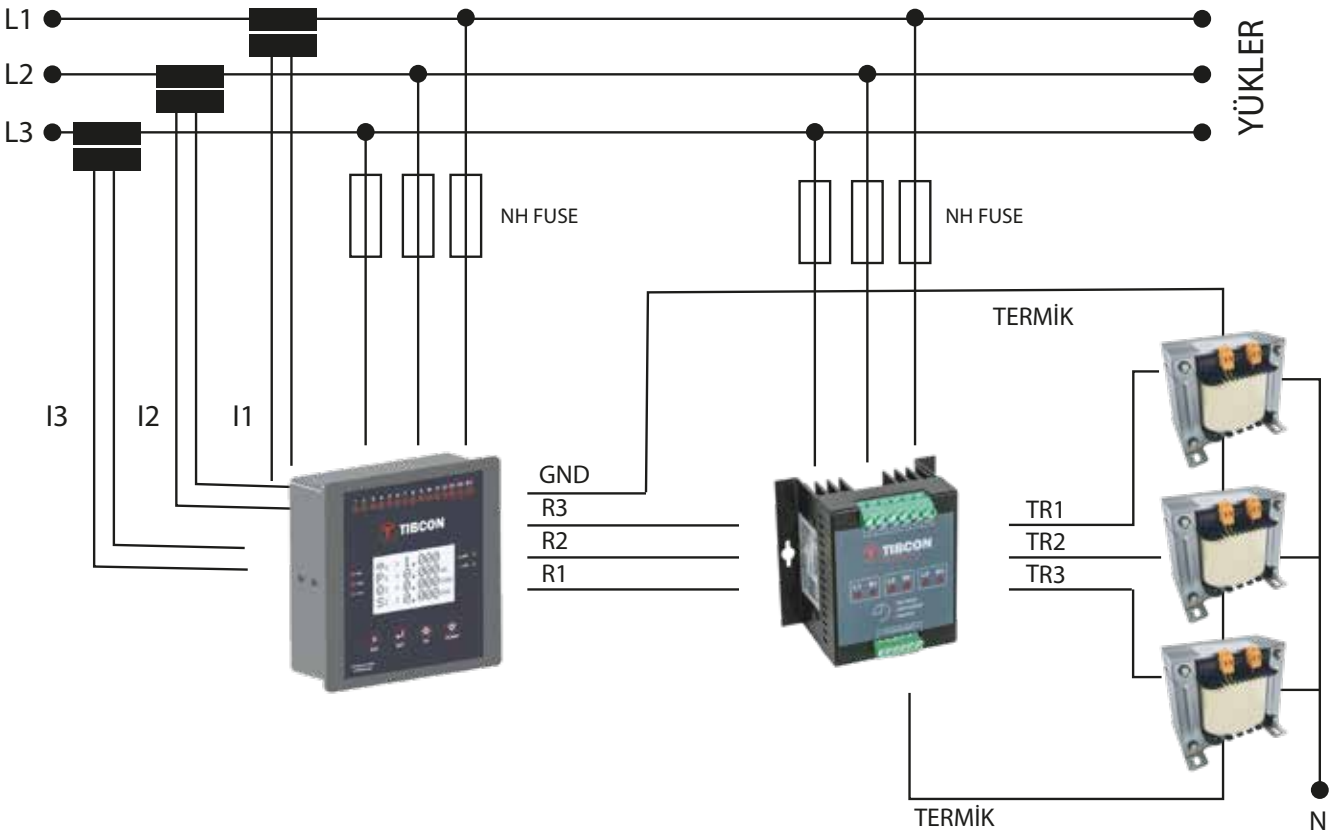
INDUCTIVE LOAD DRIVERS (SVC)

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

Operating Voltage	400 VAC
Operating Frequency	50 Hz
Power	5 kVAr-10 kVAr-20 kVAr-30 kVAr-50 kVAr-60 kVAr
Response Time	20 ms
Trigger Voltage	12V DC
Operating Altitude	<2000 m
Protection Class	IP20
Electrical Protection	Fan Protection Against Overheatin (YS-20 ES,YS-30 ES, YS-50 ES, YS-60 ES)
Humidity	Maksimum %95
Operating Temperature	-25°C ……+70°C

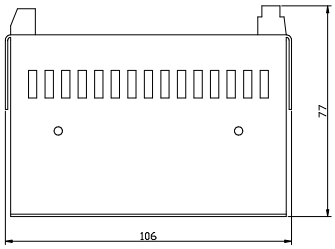
TECHNICAL DRAWINGS



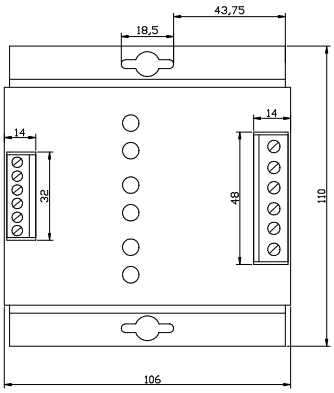
INDUCTIVE LOAD DRIVERS (SVC)

TECHNICAL DRAWINGS

YS-5 ES



YAN GÖRÜNÜŞ



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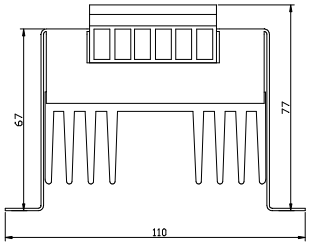
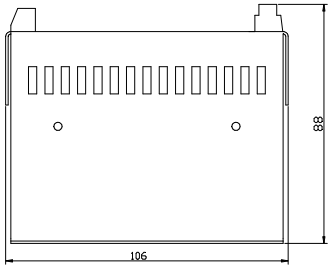


ÖN GÖRÜNÜŞ

YS-10 ES



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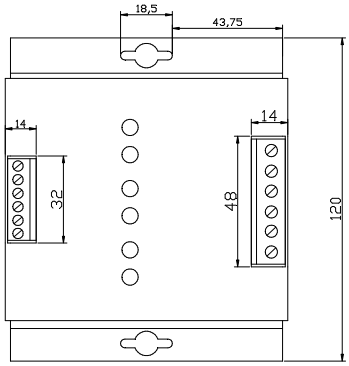

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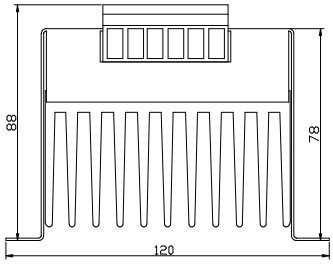
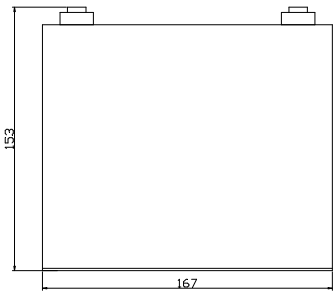
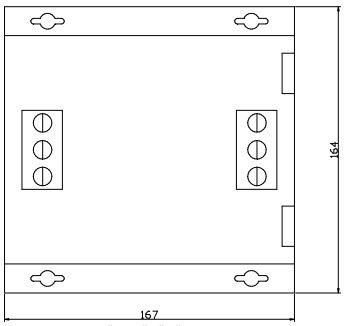


ÖN GÖRÜNÜŞ

YS-20-30-50-60 ES



YAN GÖRÜNÜŞ



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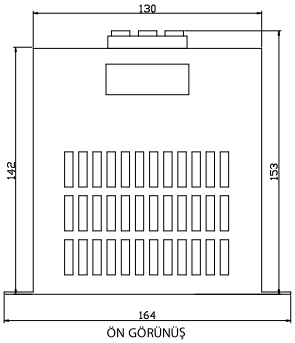
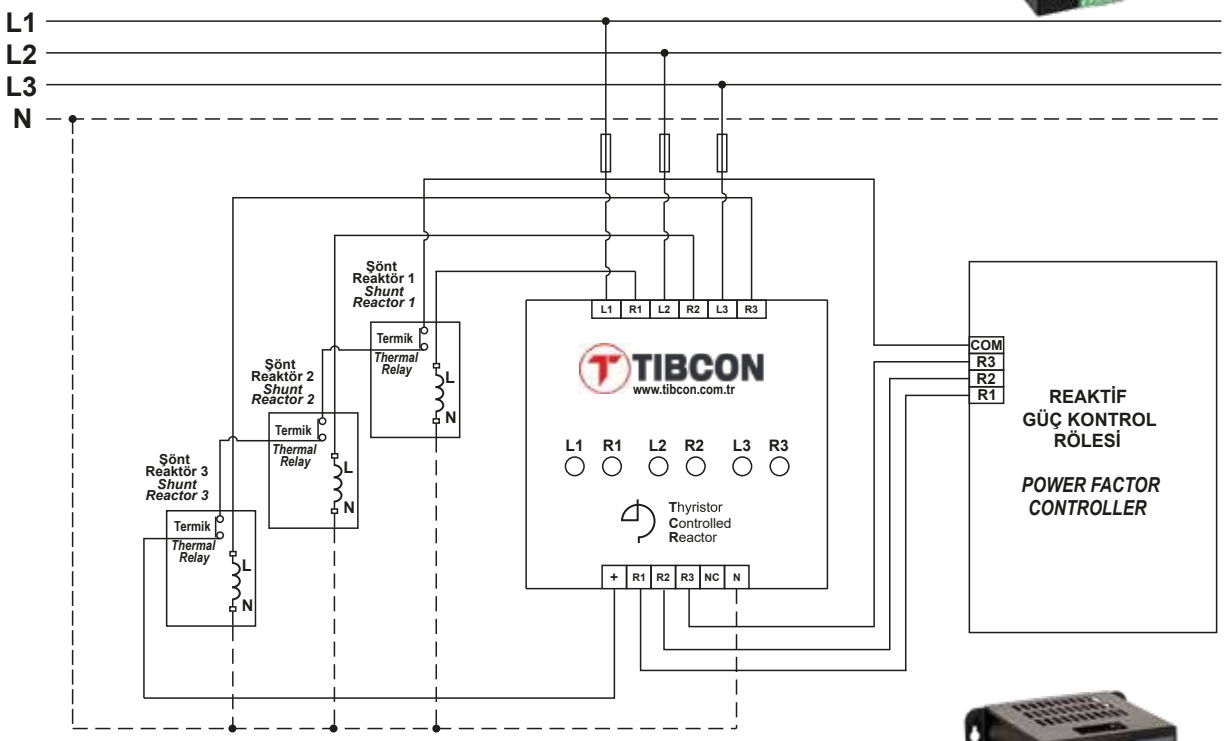


ÖN GÖRÜNÜŞ

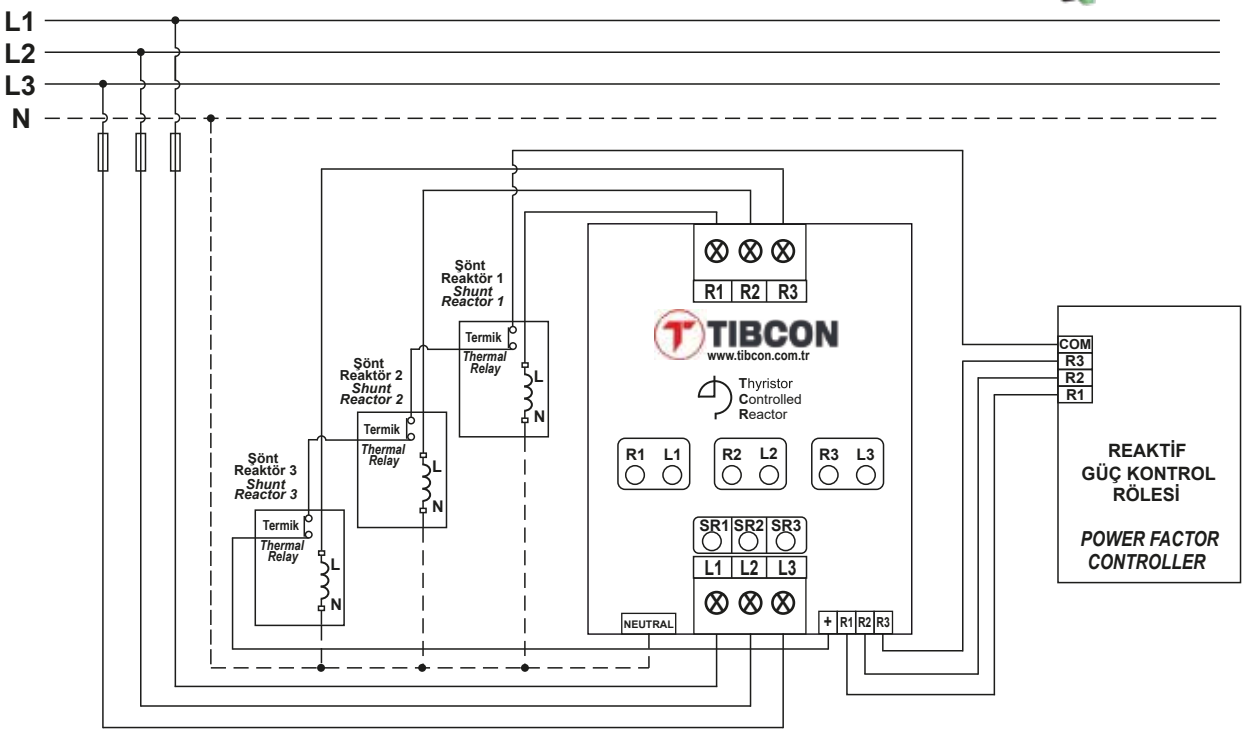
YS-5 ES / YS-10 ES Wiring Diagram

(Thermal switches trip in case of overheating, disabling all reactors.)



YS-20 ES / YS-30 / YS-50 ES / YS-60 ES Wiring Diagram

(Thermal switches trip in case of overheating, disabling all reactors.)



CAPACITIVE STATIC CONTACTOR

GENERAL INFORMATION

TTHYRISTOR CAPACITIVE STATIC CONTACTOR SWITCHING MODULES

Thyristor compensation switching modules are designed for industries with fast and variable loads, such as elevators, cranes, and spot welding machines, where loads rapidly connect and disconnect. Traditional compensation panels may be insufficient in such environments. Thyristor modules are used for safe switching on and off.

Mechanical switching elements in compensation systems require a minimum reaction time of 30 seconds. Thyristor modules switch at the zero-crossing ("O" point) of the sinusoidal wave, eliminating the need for capacitor discharge. This enables response times as fast as 20 ms to reactive changes, preventing penalties and avoiding multiple switching operations.

Direct switching with thyristors allows capacitors to be connected within 10 ms while suppressing the inrush current. Only the nominal capacitor current passes through the group. This method compensates for rapidly changing and short-duration loads without issues. Centralized compensation can achieve switching speeds between 40-200 ms.

Tibcon thyristor contactors provide effective solutions for facilities with rapid load changes where contactor systems are inadequate. Available models include 2 and 3 thyristor types; 2 thyristor modules suffice for general use. Capacitors draw high current at initial energizing, which can damage capacitors and connected contactors.

BENEFITS;

- Precise, fast, and accurate compensation, avoiding reactive power penalties
- Improved product quality in spot welding and arc welding industries
- Longer capacitor lifespan
- No maintenance costs due to absence of contactors
- Reduced thermal losses leading to energy savings
- Modular system allows scalable compensation power increases

WARNINGS:

- Always use fast NH blade fuses at static contactor inputs
- Use detuned harmonic filters or current limiting reactors matched to capacitor values at static contactor inputs
- Static contactors are designed only to switch capacitors; do not use for other applications

APPLICATION AREAS:

* Schools
- Hospitals
- Retail Stores
- Offices
- Hotels
- Bank Branches
- Public Buildings

CAPACITIVE STATIC CONTACTOR
TECHNICAL INFORMATION

Order Code	Product Code	Product Description	Power (kVAr)	Operating Voltage & Frequency	Switching Time	Dimensions (W-H-D) (mm)	Status LED	Nominal Fuse Current	Fan Protection	Nominal Cable Size (mm2)
TBE2500	TIBCON FAST 5	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ FAST 5 kVAr	5	400V 50Hz	20 ms	80x104x65	•	16		3(1x4)
TBE2501	TIBCON FAST 15	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-15 kVAr	15	400V 50Hz	20 ms	130x164x150	•	32		3(1x10)
TBE2502	TIBCON FAST 25	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-25 kVAr	25	400V 50Hz	20 ms	130x164x150	•	63	•	3(1x16)
TBE2503	TIBCON FAST 50	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-50 kVAr	50	400V 50Hz	20 ms	130x164x150	•	125	•	3(1x35)
TBE2504	TIBCON FAST 75	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-75 kVAr	75	400V 50Hz	20 ms	120x158x223	•	160	•	3(1x50)
TBE2505	TIBCON FAST 100	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-100 kVAr	100	400V 50Hz	20 ms	120x158x223	•	250	•	3(1x70)
TBE2506	TIBCON FAST 5 M	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA 5 M (3*1,5 kVAr)	3x1,5	230V 50Hz	20 ms	80x104x65	•	16		1(1x2,5)
TBE2507	TIBCON FAST 10 M	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA FAST 10 M kVAr	3X3	230V 50Hz	20 ms	95x105x80	•	25	•	1(1x4)
TBE2508	TIBCON FAST 3*15M	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA FAST 3*15 M kVAr	3X15	230V 50Hz	20 ms	80x104x65	•	32	•	1(1x10)
TBE2509	TIBCON FAST 51M	TRİSTÖRLÜ KONDANSATÖR ANAHTARLAMA MODÜLÜ-51 M kVAr	1X5	230V 50Hz	20 ms	80x104x65	•	40		1(1x4)

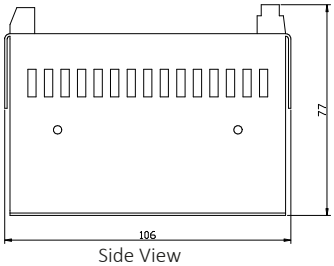
TEKNİK ÖZELLİKLER

İşletme Gerilimi	400 VAC
İşletme Frekansı	50/60 Hz
Güç	
FAST-5M-230V	3x1,5 kVAr
FAST-10M-230V	3x3,3 kVAr
FAST-15M-230V	3x15 kVAr
FAST-51M-230V	1x5 kVAr
FAST-5	5 kVAr
FAST-15	15 kVAr
FAST-25	25 kVAr
FAST-50	50 kVAr
FAST-75	75 kVAr
FAST-100	100 kVAr
Tepki Süresi	20 ms (50 Hz) / 16,66 ms (60 Hz)
Tetikleme Sinyal Gerilimi	24V
Çalışma İrtifası	<2000 m
Koruma Sınıfı	IP20
Koruma (Elektrik)	Aşırı ısınmaya karşı fan ile koruma

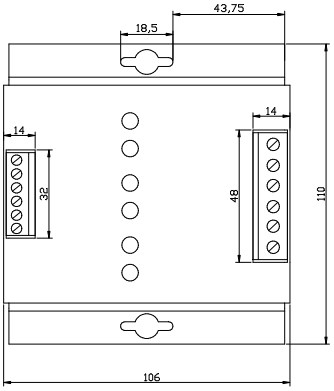
CAPACITIVE STATIC CONTACTOR

TECHNICAL INFORMATION

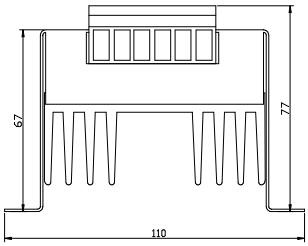
FAST-5M/51M/5T



Side View

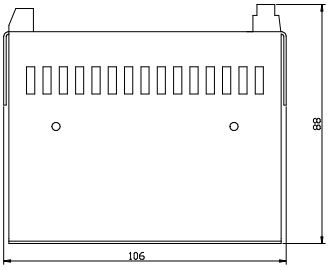


Top View

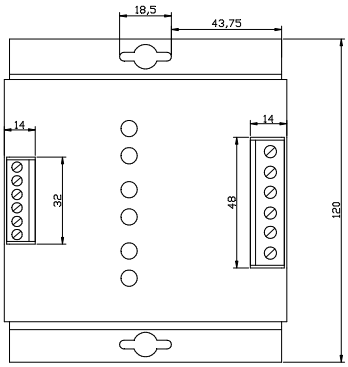


Front View

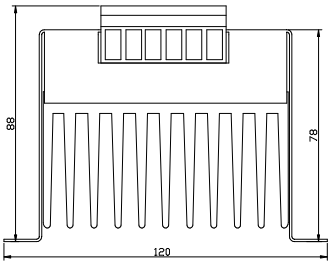
FAST 10M



Side View

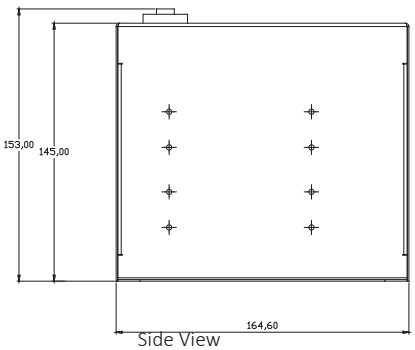


Top View

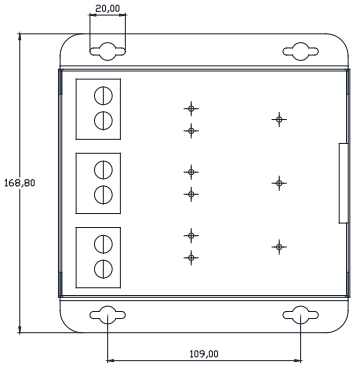


Front View

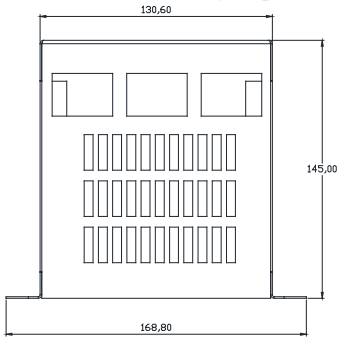
FAST-15/25/50/15M



Side View



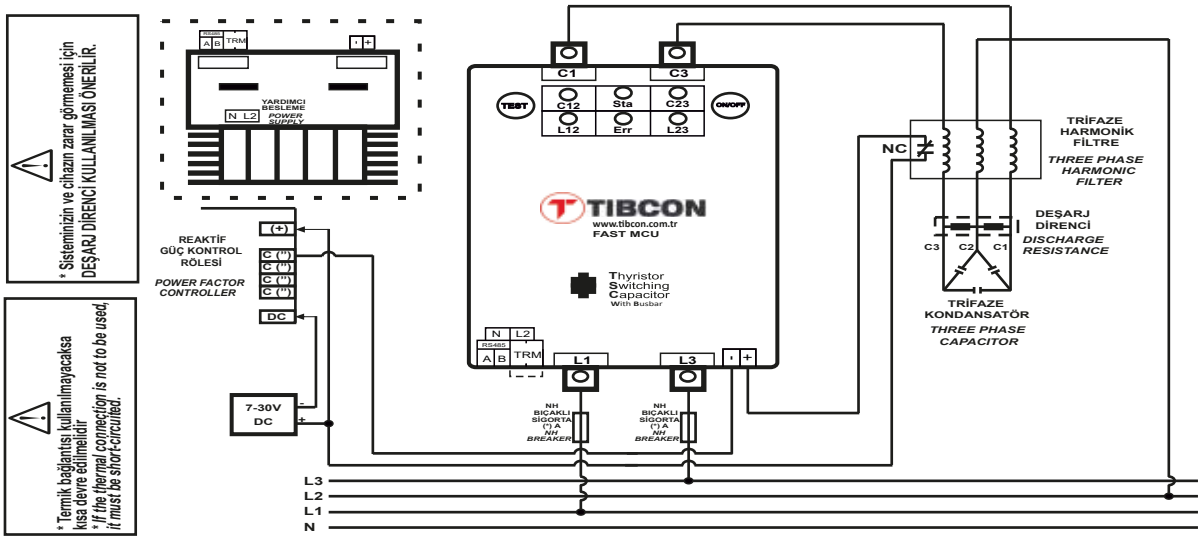
Top View



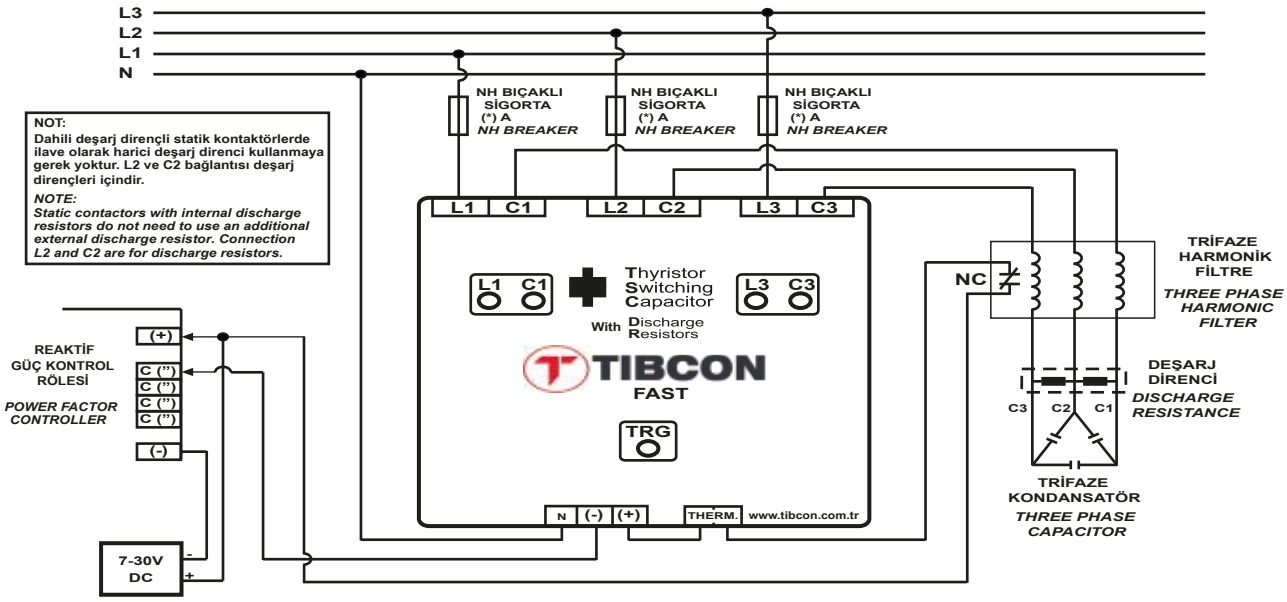
Front View

TIBCON
ENERGY TECHNOLOGIES

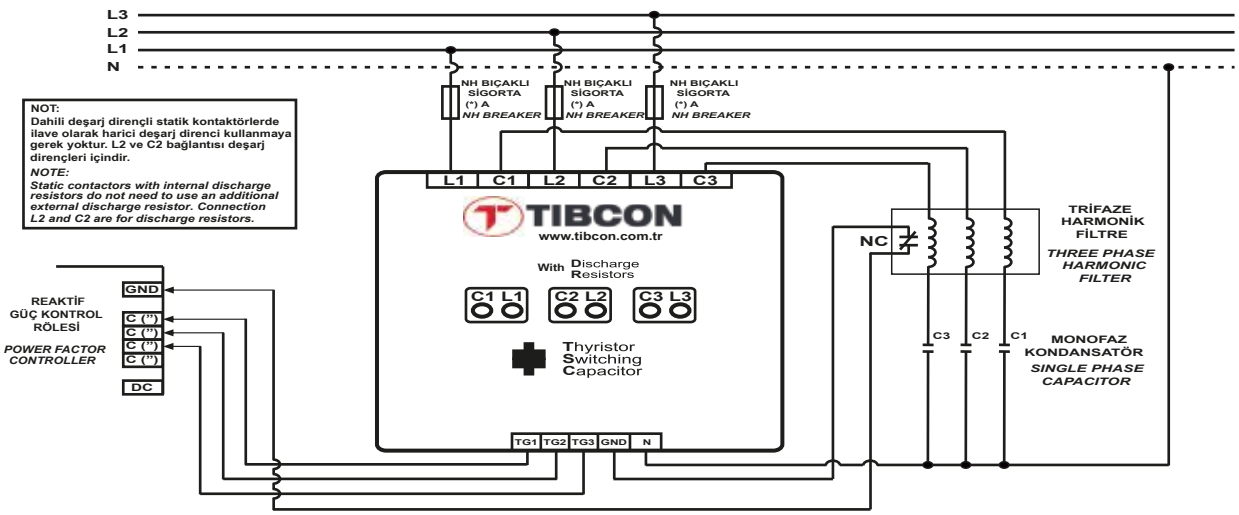
FAST-75/FAST-100 WIRING DIAGRAMS



FAST-15/FAST-25/FAST-50 WIRING DIAGRAMS



FAST-5M/FAST-10M WIRING DIAGRAMS



MCU CAPACITIVE STATIC CONTACTORS (Microcontroller-Based)

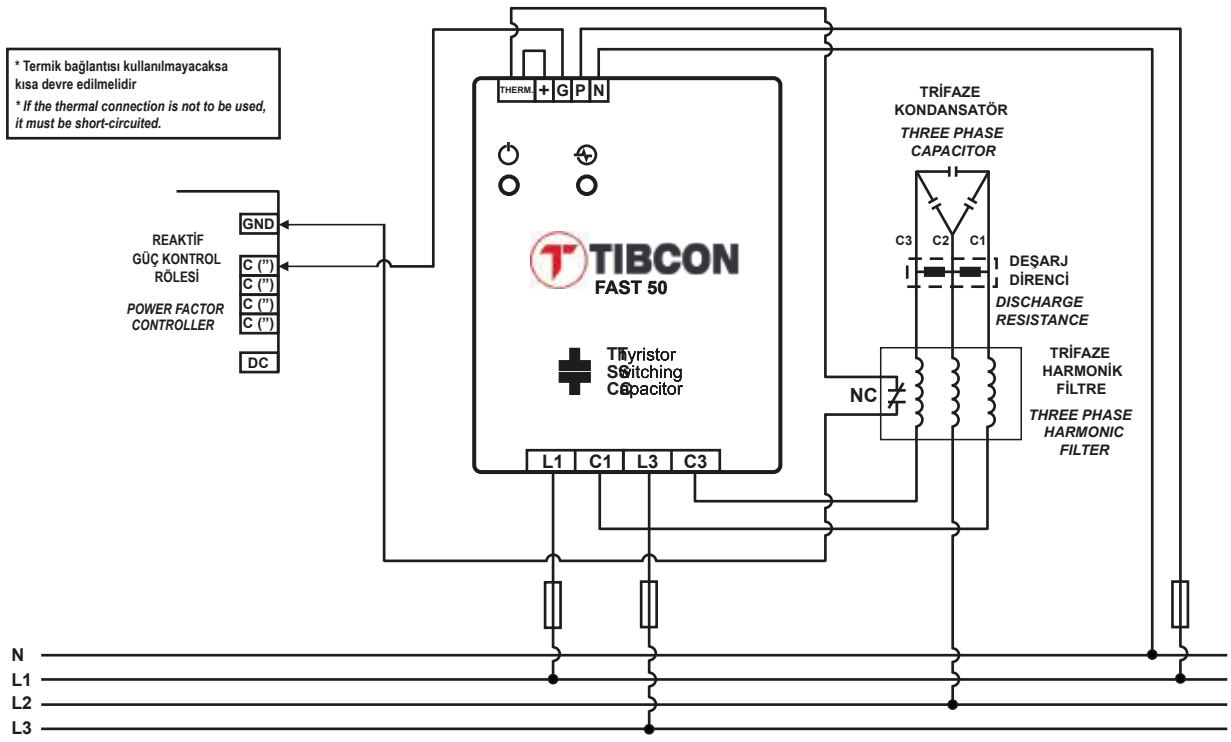
GENERAL / TECHNICAL INFORMATION

Order Code	Product Code	Operating Power kVar	Operating Voltage	Switching Time	Dimensions (W-H-D) (mm)	Nominal Fuse CurrentAkımı (A)	Fan Protection	Nominal Cable Size (mm2)
TBE2401	TBC FAST 15 MCU	15	440V 50Hz	20 ms	130x164x150	32	•	3(1x10)
TBE2402	TBC FAST 25 MCU	25	440V 50Hz	20 ms	130x164x150	63	•	3(1x16)
TBE2403	TBC FAST 50 MCU	50	440V 50Hz	20 ms	130x164x150	125	•	3(1x25)

Features:

- Power factor correction with fast response time. More efficient than contactor-based solutions for rapidly changing loads.
- Switching prevents transient voltage and current fluctuations.
- Very fast (<1 ms) response time.
- Switching does not cause harmonic generation.
- Theoretically unlimited switching lifetime/count.
- Modular and compact design.
- Easy installation suitable for different panel types.
- High quality and long service life.
- Switching capacity up to 100 kVAr.
- Operates up to 480 V voltage.
- Optional operation with any relay.
- Switching technology that requires no discharge time.
- Microcontroller-based, zero-cross switching thyristor modules developed according to IEC standards to switch loads up to 100 kVAr in industrial applications.

WIRING DIAGRAMS



DISCHARGE RESISTOR – TOROIDAL TYPE MV CURRENT TRANSFORMER
GENERAL FEATURES

DISCHARGE RESISTOR

			Maximum Power	Maximum Voltage	Dimensions (mm)	Construction Material	Cooling Type	Mounting Type
TBE2002	TVC-DD-01	DISCHARGE RESISTOR-01	50 kVAr	550 V	97 x 32 x 78	High-temperature resistant resistor alloy	Doğal hava sirkülasyonu	Screw Mounting
TBE2003	TVC-DD-02	DISCHARGE RESISTOR-02	75 kVAr	550 V	97 x 32 x 78	High-temperature resistant resistor alloy	Doğal hava sirkülasyonu	Screw Mounting

*Used in facilities with frequent load changes to discharge capacitors quickly.

TOROIDAL TYPE MV CURRENT TRANSFORMER

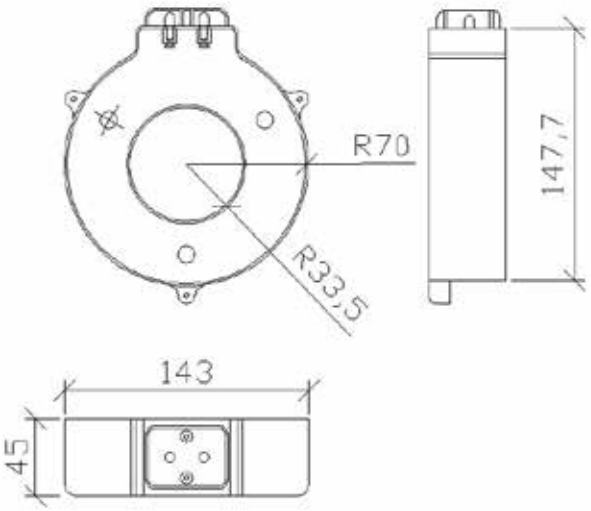
Order Code	Product Code	Product Name	Hole Diameter	VA	Primary Current	Secondary Current	Operating Voltage	Dimensions (mm)
TBE2800	OG 50/5	TOROİDAL TİP OG AKIM TRAFOSU	72,90	2,5	50	5	0,72	147,70x143x45

*Must be used together with our MV-referenced reactive power relay. Should be installed on insulated MV XLPE cable, not on MV busbars.

Technical Information on Label:

- Ratio: 50/5
- Class: 0.5FS5
- Temperature: -25 .. +40°C
- Load: 2.5 VA
- Frequency: 50 Hz
- Standard: IEC 61869-2
- Primary Current: 50 A
- Secondary Current: 5 A
- Power Capacity: 2.5 VA

Mechanical Dimensions:



Key Features:

- High Accuracy: Designed for precise measurement and compensation.
- Energy Saving: Helps reduce costs and protect the environment through reactive power compensation.
- Durable Structure: Compact, robust, and long-lasting design for various applications.

Applications:
Ideal for high-performance MV reactive power compensation applications in factories and large industrial plants.
(Compatible with TET 15A and 18A Reactive Power Control Relays)

TİBCON SVG-AHF

Static Var Generator

In the industrial and commercial sectors, increasing electricity demand makes reactive power compensation systems even more critical for maintaining power system stability and improving transmission efficiency.

SVG (Static Var Generator) systems are advanced power electronic devices developed for this purpose, capable of generating or absorbing reactive power to ensure voltage stability and improve power quality.

Advantages of the SVG System

Bidirectional Compensation:

Traditional compensation systems use capacitors for inductive loads and reactors for capacitive loads. SVG provides both inductive and capacitive compensation at the same power level, offering a flexible and efficient solution for both load types.

Stepless & Fast Operation:

While traditional power factor correction systems use 1-12 step compensation, these steps may not always provide accurate correction. SVG achieves full compensation with a response time of 10 ms and no steps, starting from 0.1 kVAr. It provides instant and complete compensation even in areas with rapid load changes.

User-Friendly Interface:

Key parameters such as voltage, current, and frequency can be monitored via the HMI screen, and the device can be easily programmed. Also supports MODBUS RTU communication. Takes up minimal space compared to traditional panels due to its compact design.

SVG devices provide safe reactive power compensation with no resonance risk. There are no insulation or heating issues, and losses are minimal—ensuring efficient and safe operation.

Long-Life, Maintenance-Free Structure:

Unlike traditional systems, SVG has no mechanical components that can fail or need maintenance. It can operate uninterrupted for 10+ years. Also requires less cooling, increasing energy efficiency.

TIBCON
ENERGY TECHNOLOGIES

- Monitoring of voltage, current, and power factor
- Algorithms to determine required reactive power
- Use of electronic components to generate reactive power
- 100% phase balancing for optimal performance
- Quick and easy installation
- Harmonic filtering up to 13th harmonic
- Modular structure allows easy capacity increase
- Harmonic filtering and voltage quality improvement
- Bidirectional and fast reactive power compensation
- Phase imbalance correction

High-Performance Features

- 3-phase + Neutral compatibility, rack or wall-mounted IGBT-based real-time filtering system
- Power factor is actively controlled to maintain a stable COSϕ value between 0.99 and 1.00
- Independent, stepless compensation per phase
- Supports both inductive and capacitive compensation with instant response to load changes

YNext-Generation Compensation Technology

- Does not include capacitors, contactors, or traditional filters
- Fully electronic IGBT-based design for fast and stable compensation
- User-friendly HMI interface for easy setup and configuration
- No mechanical parts → maintenance-free, long-lasting and reliable

Flexible Applications

- Multiple units can be connected in parallel for scalable compensation capacity
- Load balancing reduces phase imbalance
- Saves space with rack or wall-mount options
- Supports panel, busbar, or cable connections for easy system integration
- Safe and efficient at low, medium, and high power levels

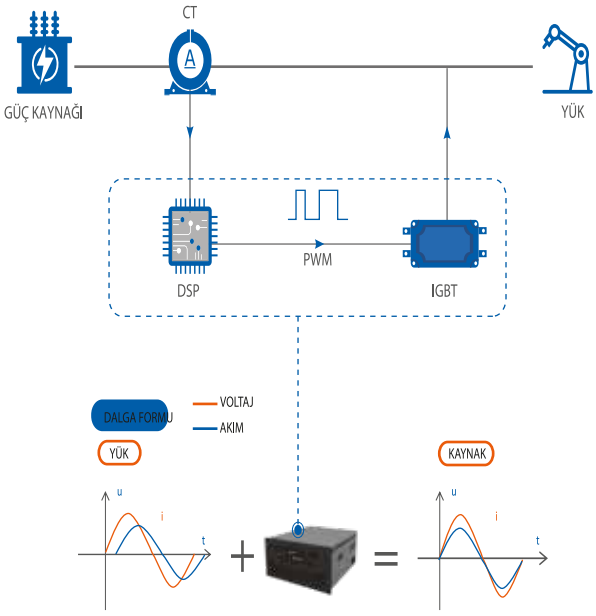
Fast & Stable Performance

- Real-time compensation with <15 ms response time
- Precise and complete compensation with no over/under-compensation risks
- No resonance risk, operates without harmonic distortion

Main Application Areas;

- Buildings and offices
- Bank HQs and data centers
- Steel production plants
- Cement factories
- Mining and processing facilities
- Chemical and process industries
- Textile production plants
- Petrochemical and refinery fields
- Ports and crane applications
- Public buildings
- Solar energy systems and EV charging stations

STATİK VAR GENERATOR
TECHNICAL SPECIFICATIONS



Operating Principle

- Monitors load current via external CTs
- DSP analyzes reactive power and calculates compensation
- IGBT module generates inductive or capacitive reactive current

User Interface

SVG displays key parameters (voltage, current, active/reactive power, frequency, harmonics) in real time. All system settings and configurations can be made easily via a user-friendly touch HMI.

Feature	30 KVAR	50 KVAR	75 KVAR	100 KVAR
Module Dimensions (Rack Type)	444*149*641	444*149*641	520*237*759	520*237*759
Module Dimensions (Wall Type)	501*609*142	501*609*142	581*729*230	581*729*230
Device Weight	24,5 kg	24,5 kg	51 kg	51 kg
Cooling Method	Thermostat-Controlled Fan			
Harmonic Suppression	2. ~ 13.			
Operating Voltage	340–460V (Optional 690V 3P3W)			
MTBF	≥ 100,000 hours			
Phase Imbalance Tolerance	%100 Correction			
Electrical Connection Type	3P3W/ 3P4W			
Aktif Güç Tüketimi	<3% Nominal modül gücü			
Reaktif Güç Yönetimi	-1 ile +1 Arasında Ayarlanabilir			
Koruma Mekanizmaları	Aşırı ve düşük gerilim durumları, inverter köprü ters akımı, aşırı kompanzasyon, aşırı yüklenme, dahili kısa devre, aşırı sıcaklık ve fan arızaları için gelişmiş koruma ve alarm sistemleriyle donatılmıştır.			
Active Power Consumption	50/5'den 6000/5'e kadar			
Reactive Power Management	Ekran Başına 8 Modül ile eşleştirilebilir.			
Protections	100% indükif veya kapasitif			
CT Ratio	THDi<5%			
Parallel Operation Support	<65 dB			
Target Cosϕ	≥ 97% (Labaratuvar verileri)			
Filtering Efficiency	50Hz / 60Hz (±5 %)			
Operating Frequency	20kHz			
IGBT Switching Frequency	<100µs			
Response Time	3 Katmanlı			
Topology Design	RS485 & MODBUS			
Communication Ports	Modbus Protokol & Opsiyonel Ethernet			
Ambient Temperature Range	(-20°C / +45°C)			
Display	4,3 inç Dokunmatik Dahili Ekran / Harici 7 inç LCD Dokunmatik Ekran			
Protection Class (IP Rating)	IP20			
Yanıt Süresi	<10ms			
Color	Siyah			
Mounting Type	Dikili Tip / Duvara Montajlı			
Max Operating Altitude	"2000m her 100 m de güç %1 azalır"			
Humidity	5%-95% Yoğuşmasız			
Standards & Regulations	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011, EN 50178:1997 IEEE519 IEC 62477-1			
İlgili Yönetmelikler	2014/30 EU 2014/35/EU			

TIBCON ENERGY TECHNOLOGIES

TIBCON ACTIVE HARMONIC FILTERS

A New Standard in Power Quality

TIBCON Active Harmonic Filters (AHF) are advanced filtering solutions that detect and eliminate high-frequency harmonic components in real-time. They are connected in parallel to busbars that supply harmonic-generating loads.
Harmonics from motor drives, UPS systems, and SMPS devices can lead to voltage distortions, phase imbalances, and equipment performance issues. 3rd and higher-order harmonics in the neutral line can cause voltage rise, overheating, and failure in sensitive equipment. Harmonics also increase RMS current, resulting in energy losses and higher operational costs.
Passive filters are insufficient for systems with load imbalances or variable harmonic characteristics—active solutions are essential.

Operating Principle of Active Harmonic Filters

Connected in parallel, AHF continuously monitors and analyzes system current. It then generates counter-phase harmonic currents to cancel the detected distortion, maintaining a clean sinusoidal waveform.

Key Technical Features

Real-Time Response:
High-speed DSP processors detect and neutralize harmonic components instantly.

Wide Frequency Range:
Effective filtering from 2nd to 51st harmonic ensures top-tier energy quality.

Dynamic Load Adaptation:
Stable operation even during sudden load changes, preserving system stability.

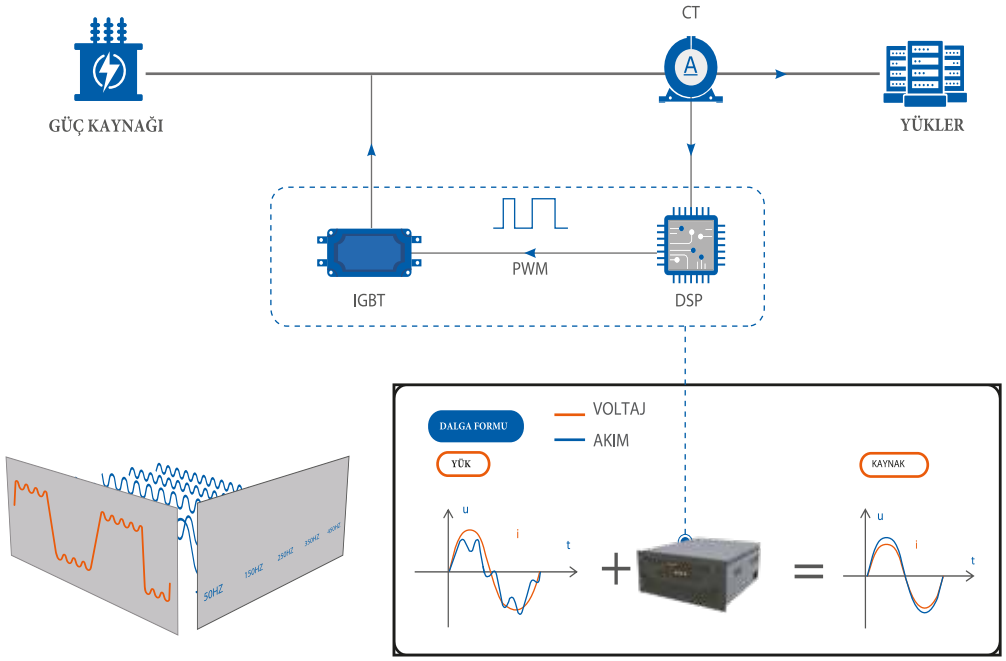
Increased Energy Efficiency:
Minimizes harmonic-related losses and reduces operating costs.

Equipment Protection & Longevity:
Reduces thermal and dielectric stress on motors, transformers, and cables, ensuring safer and longer operation.

High Power Quality:
Preserves sinusoidal waveform of voltage and current, providing a stable and clean power flow—crucial for sensitive loads.

TIBCON ACTIVE HARMONIC FILTERS – AHF

TECHNICAL SPECIFICATIONS



Technical Details	15A	30A	50A	75A	100A	125A	150A
Module Dimensions (mm) – Rack Type	501x609x142	501x609x142	501x609x142	501x609x142	581x729x230	581x729x230	581x729x230
Module Dimensions (mm) – Wall Mounting	444x149x641	444x149x641	444x149x641	520x237x759	520x237x759	520x237x759	520x237x759
Filtration Performance	THDi<5%						
Frequency Range	50Hz / 60Hz (±5 %)						
IGBT Switching Frequency	20kHz						
Total Weight	24.5 kg.	24.5 kg.	24.5 kg.	24.5 kg.	51 kg.	51 kg.	51 kg.
Harmonic Suppression Capability	2. ~ 51.						
Filtration Efficiency Ratio	≥ 97% (Labaratuvar verileri)						
Operating Voltage	340–460V (Optional 690V 3P3W)						
Response Time	<5ms						
Noise Level (dB)	<65 dB (A)						
Connection Type	Lorem ipsum3P3W/ 3P4W						
Phase Imbalance Control	100% Imbalance Correction						
Reactive Power Balancing	Adjustable between-1 and +1						
Response Speed	<100us						
Cooling Mechanism	Thermostat Controlled Fan Cooling						
Protection Features	Protection and alarm system for over/under voltage, overcompensation, overload, overheating, busbar short circuit, fan failure						
Display Type	4.3" Touch Internal Screen / Optional 7" LCD Touch External Display						
Target Power Factor (Cos ϕ)	1 ± 0,1 Cos phi						
CT (Current Transformer) Ratio	From 50/5 to 6000/5						
Operating Temperature	(-20°C / +45°C)						
Humidity Resistance (Relative Humidity)	5%–95% Non-condensing						
Applicable Regulations	2014/30 EU 2014/35/EU						
Protection Class	IP20						
Installation Method	Free-standing / Wall-mounted						
Topology Design	3-Level						
Communication Protocol	Modbus Protocol & Optional Ethernet						
Communication Input	RS485 & MODBUS						
Operating Altitude	"Power decreases by 1% per 100 m above 2000 m"						
Applicable Standards	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011, EN 50178:1997 IEEE519 IEC 62477-1						
Parallel Module Support	Can be matched with 8 modules per screen.						
Enclosure Color	Black						

TIBCON ENERGY TECHNOLOGIES

HARMONIC FILTER REACTORS & INDUCTIVE LOAD (SHUNT) REACTORS

TIBCON HARMONIC FILTER REACTORS (De-Tuned Reactors)

GENERAL INFORMATION

HARMONIC FILTERS

Harmonic distortions caused by non-linear loads in energy systems create serious problems in industrial facilities. To eliminate failures caused by such distortions, harmonic filters are connected in series with capacitors in compensation systems.

The purpose of harmonic filters is not to eliminate harmonics completely but to prevent their increase due to the lowered impedance of capacitors at high frequencies when the system is energized. One major issue is harmonic resonance.

In some cases, resonance circuits form between capacitor and grid impedance, leading to phase-to-phase short circuits and severe damage. These problems can be prevented by placing a reactor in front of the capacitor. These reactors, placed in series with capacitors, provide high impedance to high-frequency harmonics

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MAIN FAILURES CAUSED BY HARMONIC DISTORTIONS

- Overheating in electromechanical devices and cables
- Mechanical vibrations in machines
- Malfunction in ignition circuits
- Voltage spikes
- Insulation breakdown in cables and devices
- Failures in electronic boards, computers
- Power losses, explosions in capacitors
- Frequent tripping of compensation fuses
- Unexpected circuit breaker trips
- Relay signal disruptions
- General energy losses

MAIN CAUSES OF HARMONIC DISTORTIONS

- UPS systems
- Motor starters and drives
- Speed controllers
- Computers and electronic lighting
- Welding machines
- Power electronics converters
- Rectifiers and similar devices

Proper selection of filters and capacitors is essential in filtered compensation systems. Design is based on resonance frequency (commonly 134, 189, 210, or 215 Hz), capacitor power, and capacitor voltage.

Be aware that filters output higher voltage than the grid, and especially in industrial zones where night-time voltages are high, use capacitors with suitable voltage ratings. Using incorrect capacitor specs may shift resonance frequency and reduce system performance. Proper ventilation must be ensured due to heat generation.

The total power of harmonic filtered compensation systems differs from the sum of capacitor powers. Always include the filter power in calculations to avoid under-compensation.

Voltage THD (THDV) is a key indicator of harmonic distortion:

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- THDV < 1% → Clean
- 1% < THDV < 3% → Mild Pollution
- 3% < THDV < 5% → Severe Pollution
- THDV > 5% → DANGEROUS

TIBCON HARMONIC FILTERS GENERAL SPECIFICATIONS

Production Standards	EN 61558-1, EN 61558-2-20, EN 60289, EN 60076-6 | CE Certified
Rated Power	Single Phase: 0.10–10 kVAr | Three Phase: 0.5–100 kVAr
Rated Voltage	230 VAC .... 1000 VAC
Rated Frequency	50 Hz (60 Hz Optional)
Reactor Factor	p=%100
Inductance Tolerance	3%
Standard Resonance Frequencies	189Hz P=%7- 134Hz P=% 14- 210Hz P=%5,67-215 Hz P=%5,41
Magnetic Circuit	0.35 mm silicon laminated steel with high magnetic permeability
Windings	Electrolytic copper or aluminum foil wire
Design	Air gap design
Connections	Transformer terminal, DIN rail terminal, SKP lug, copper busbar
Electrical Protection	Terminal protection against overheating
Protection Class	IP00 (Custom enclosures on request)
Insulation Class	Class F (155°C) or H (180°C)
Impregnation	Varnish under vacuum for F or H class (on request)
Humidity Tolerance	95% Non-condensing (DIN 40040)
Operating Altitude & Temperature	0- 2000 m
Storage Temperature	10°(.... +40°(
Nominal Frequency	10°(..... +70°(
Operating Altitude	O- 2000 m
Operating Ambient Temperature	-10°C....+40°C
Customized Production	Special designs can be made upon request

TIBCON HARMONIC FILTERS
TECHNICAL INFORMATION

THREE-PHASE HARMONIC FILTER (189Hz, p=7%, THDV 8%)

Order Code	Product Code	Product Description	A	B	C	L (mH)	I rms (A)	Connection	Weight (Kg)
TBHR5200	HRT-73400,5	0,50 KVAR Three-phase Harmonic Filter %7	145	150	54	70,98	0,8	Klemens	1,4
TBHR5201	HRT-73401	1 KVAR Three-phase Harmonic Filter %7	145	150	54	38,33	1,6	Klemens	1,5
TBHR5202	HRT-73401,5	1,5 KVAR Three-phase Harmonic Filter %7	145	150	54	25,53	2,4	Klemens	1,5
TBHR5203	HRT-73402,2	2,2 KVAR Three-phase Harmonic Filter %7	145	150	74	17,5	3,52	Klemens	2,2
TBHR5204	HRT-73402,5	2,5 KVAR Three-phase Harmonic Filter %7	145	150	74	15,32	4	Klemens	2,2
TBHR5205	HRT-73403,1	3,1 KVAR Three-phase Harmonic Filter %7	168	180	79	12,28	5	Klemens	2,5
TBHR5206	HRT-73404,4	4,44 KVAR Three-phase Harmonic Filter %7	180	180	120	8,63	7,1	Klemens	4,8
TBHR5207	HRT-73405	5 KVAR Three-phase Harmonic Filter %7	180	180	120	7,66	8	Klemens	5,3
TBHR5208	HRT-73406,25	6,25 KVAR Three-phase Harmonic Filter %7	180	180	120	6,15	10	Klemens	5,5
TBHR5209	HRT-73406,66	6,66 KVAR Three-phase Harmonic Filter %7	180	180	130	5,78	10,65	Klemens	7
TBHR5210	HRT-73407,5	7,5 KVAR Three-phase Harmonic Filter %7	180	180	130	5,11	12	Klemens	7
TBHR5211	HRT-73408,8	8,88 KVAR Three-phase Harmonic Filter %7	180	180	130	4,31	14,2	Klemens	8
TBHR5212	HRT-734010	10 KVAR Three-phase Harmonic Filter %7	180	180	140	3,83	16	Klemens	8
TBHR5213	HRT-734011,1	11,10 KVAR Three-phase Harmonic Filter %7	180	180	150	3,45	17,7	Klemens	9,8
TBHR5214	HRT-734012	12,5 KVAR Three-phase Harmonic Filter %7	180	180	150	3,06	20	Klemens	9,8
TBHR5215	HRT-734013,3	13,3 KVAR Three-phase Harmonic Filter %7	180	180	150	2,88	21,2	Klemens	10
TBHR5216	HRT-734015	15 KVAR Three-phase Harmonic Filter %7	180	180	150	2,55	24	Klemens	10
TBHR5217	HRT-734017,7	17,77 KVAR Three-phase Harmonic Filter %7	210	240	160	2,18	28	Pabuç	12
TBHR5218	HRT-734020	20 KVAR Three-phase Harmonic Filter %7	210	240	160	1,92	32	Pabuç	12,5
TBHR5219	HRT-734022,2	22,2 KVAR Three-phase Harmonic Filter %7	210	240	160	1,72	36	Pabuç	12,5
TBHR5220	HRT-734025	25 KVAR Three-phase Harmonic Filter %7	210	240	160	1,53	40	Bara	15
TBHR5221	HRT-734026,6	26,65 KVAR Three-phase Harmonic Filter %7	210	240	160	1,44	42,6	Bara	15
TBHR5223	HRT-734030	30 KVAR Three-phase Harmonic Filter %7	210	240	180	1,28	48	Pabuç	17
TBHR5224	HRT-734035,5	35,5 KVAR Three-phase Harmonic Filter %7	210	240	180	1,08	57	Pabuç	19
TBHR5225	HRT-734040	40 KVAR Three-phase Harmonic Filter %7	250	260	160	0,96	64	Bara	21
TBHR5226	HRT-734044	44,4 KVAR Three-phase Harmonic Filter %7	250	260	160	0,86	70	Bara	21
TBHR5227	HRT-734050	50 KVAR Three-phase Harmonic Filter %7	260	300	150	0,77	80	Bara	23
TBHR5228	HRT-734053	53,3 KVAR Three-phase Harmonic Filter %7	260	300	150	0,64	84	Bara	23
TBHR5229	HRT-734060	60 KVAR Three-phase Harmonic Filter %7	260	300	160	0,57	96	Bara	27
TBHR5230	HRT-734066,6	66,6 KVAR Three-phase Harmonic Filter %7	260	300	160	0,51	106	Bara	30
TBHR5231	HRT-734075	75 KVAR Three-phase Harmonic Filter %7	260	300	180	0,51	120	Bara	35
TBHR5232	HRT-734080	80 KVAR Three-phase Harmonic Filter %7	260	300	190	0,48	128	Bara	40
TBHR5233	HRT-734088,8	88,8 KVAR Three-phase Harmonic Filter %7	260	300	200	0,43	142	Bara	42
TBHR5234	HRT-7340100	100 KVAR Three-phase Harmonic Filter %7	310	360	200	0,38	160	Bara	48

For THDU 12–14% applications and reinforced copper-winding filter options, please contact us.
Products without specified values are made to order. Contact us for detailed information

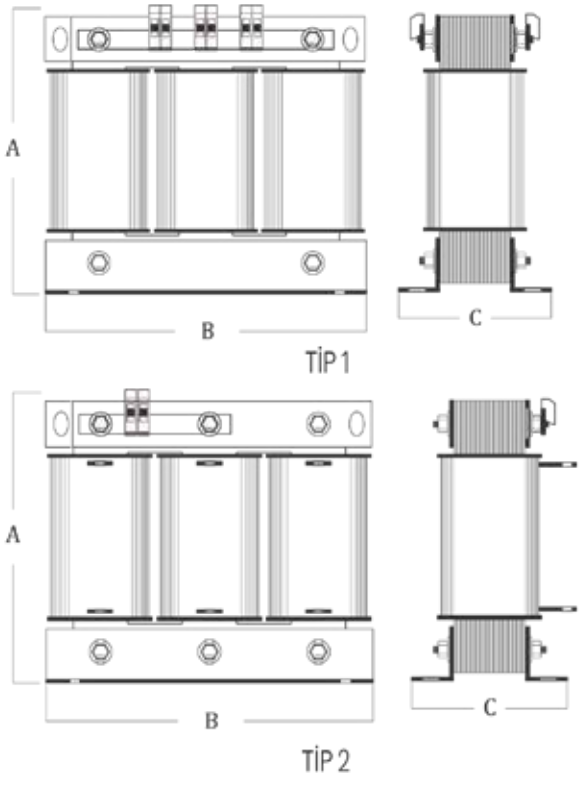
THREE-PHASE HARMONIC FILTER (134 Hz, p=%14, THDV:10)

Order Code	Product Code	Product Description	Type	A	B	C	LN	IRMS	Connection	Weight
TBHR6205	HRT143403,1	3,1 KVAR Three-phase Harmonic Filter %14	TİP1	180	160	74	33,16	4,77	Klemens	6
TBHR6208	HRT143405	5 KVAR Three-phase Harmonic Filter %14	TİP1	180	180	84	16,58	7,7	Klemens	7,5
TBHR6212	HRT143406,25	6,25 KVAR Three-phase Harmonic Filter %14	TİP1	180	180	94	13,26	9,6	Klemens	9
TBHR6214	HRT143407,5	7,5 KVAR Three-phase Harmonic Filter %14	TİP1	230	210	100	11,05	11,5	Klemens	9,5
TBHR6216	HRT1434010	10 KVAR Three-phase Harmonic Filter %14	TİP1	230	240	100	8,29	15,4	Klemens	10
TBHR6221	HRT1434012,5	12,5 KVAR Three-phase Harmonic Filter %14	TİP1	230	240	120	6,6	19,2	Klemens	12,5
TBHR6223	HRT1434015	15 KVAR Three-phase Harmonic Filter %14	TİP1	230	240	150	5,5	23	Klemens	15
TBHR6227	HRT1434020	20 KVAR Three-phase Harmonic Filter %14	TİP2	230	240	160	4,15	30,8	Bara	16
TBHR6233	HRT1434025	25 KVAR Three-phase Harmonic Filter %14	TİP2	260	300	170	3,32	38,5	Bara	24
TBHR6236	HRT1434030	30 kVAr TRİFAZE HARMONİK FİLTRE %14	TİP2	260	300	170	2,76	46	Bara	26
TBHR6245	HRT1434040	40 KVAR Three-phase Harmonic Filter %14	TİP2	260	300	190	2,07	61,5	Bara	39
TBHR6254	HRT1434050	50 KVAR Three-phase Harmonic Filter %14	TİP2	260	300	200	1,66	77	Bara	45
TBHR6257	HRT1434060	60 KVAR Three-phase Harmonic Filter %14	TİP2	310	360	200	1,38	92	Bara	48

*For reinforced and copper-wound filters suitable for voltage harmonic values THDU 12–14%, please contact us.
*Products without specified values are manufactured upon order. For more details, please contact us.

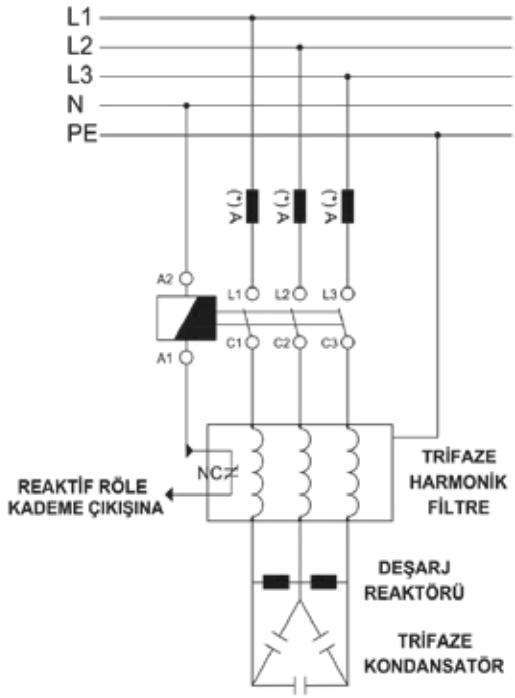
Technical Drawing

TEKNİK ÇİZİMİ



Connection Diagram

BAĞLANTI ŞEMASI



TIBCON HARMONIC FILTERS
TECHNICAL INFORMATION

SINGLE-PHASE HARMONIC FILTER 189 Hz, P=%7 (THDV:8)

Order Code	Product Code	Product Description	Type	A	B	C	LN	IRMS	Connection	Weight
TBHR5000	HRT-71230,5	0,5 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	82	78	55	31,8	2,9	Klemens	1,2
TBHR5001	HRT-71231	1 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	88	84	65	12,7	5,3	Klemens	1,5
TBHR5002	HRT-71231,5	1,5 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	88	84	79	8,5	7,9	Klemens	2,5
TBHR5005	HRT-71232,5	2,5 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	100	96	86	5,1	13,2	Klemens	4
TBHR5007	HRT-71235	5 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	122	120	110	2,5	26,3	Klemens	6
TBHR5008	HRT-71237,5	7,5 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	148	150	85	1,7	39,5	Klemens	8
TBHR5009	HRT-712310	10 KVAR SINGLE-PHASE HARMONIC FILTER %7	TİP1	148	150	97	1,3	52,6	Klemens	11

SINGLE-PHASE HARMONIC FILTER 210-Hz P=%5,67 (THDV:8)

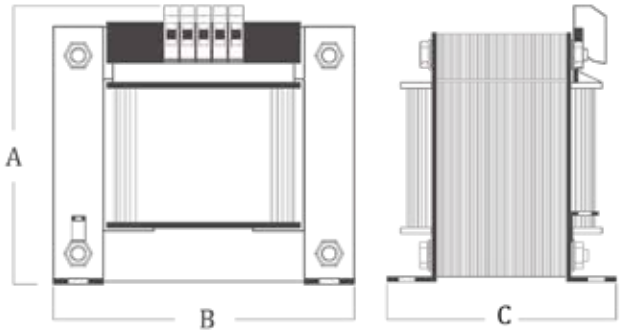
Order Code	Product Code	Product Description	Type	A	B	C	Ln (Mh)	I n (A)	I th (A)	I lin (A)	Connection	Weight
TBHR6004	HRT-51230,5	0,5 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	70	85	85	31,8	2,6	2,89	4,59	Klemens	1,15
TBHR6005	HRT-51231	1 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	85	85	85	12,7	5,21	5,26	8,32	Klemens	1,65
TBHR6006	HRT-51231,5	1,5 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	85	100	100	8,5	7,82	7,89	12,5	Klemens	2,1
TBHR6007	HRT-51232,5	2,5 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	90	120	115	5,1	13,04	13,2	20,9	Klemens	2,85
TBHR6008	HRT-51235	5 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	110	150	130	2,5	26,08	26,3	41,6	Klemens	4,95
TBHR6009	HRT-51237,5	5,67,5 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	120	150	130	1,7	39,13	39,5	52,5	Klemens	6,95
TBHR6010	HRT-512310	10 KVAR SINGLE-PHASE HARMONIC FILTER %5,67	TİP1	150	150	130	1,3	52,17	52,6	83,2	Klemens	10,95

SINGLE-PHASE HARMONIC FILTER 134-Hz P=%14 (THDV:10)

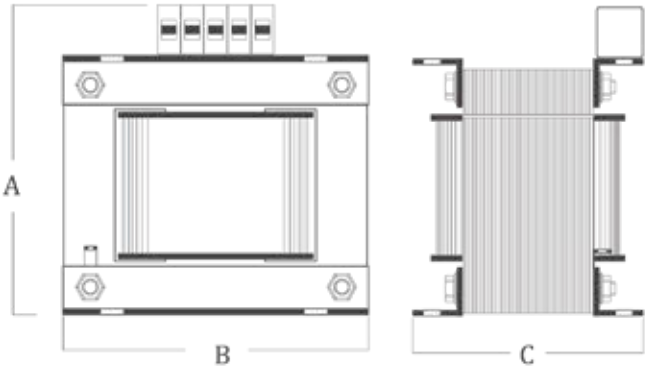
Order Code	Product Code	Product Description	Type	A	B	C	Ln (Mh)	I n (A)	I th (A)	I lin (A)	Connection	Weight
TBHR6011	HRT-141230,5	0,5 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	70	85	85	31,8	2,23	2,89	4,59	Klemens	1,1
TBHR6012	HRT-141231	1 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	85	85	85	12,7	4,47	5,26	8,32	Klemens	1,75
TBHR6013	HRT-141231,5	1,5 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	85	100	100	8,5	6,71	7,89	12,5	Klemens	2,25
TBHR6014	HRT-141232,5	2,5 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	90	120	115	5,1	11,19	13,2	20,9	Klemens	3,2
TBHR6015	HRT-141235	5 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	110	150	130	2,5	22,39	26,3	41,6	Klemens	6,3
TBHR6016	HRT-141237,5	14,5 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	120	150	130	1,7	33,58	39,5	52,5	Klemens	8,1
TBHR6017	HRT-1412310	10 KVAR SINGLE-PHASE HARMONIC FILTER %14	TİP1	150	150	130	1,3	44,78	52,6	83,2	Klemens	11,3

Technical Drawing

TEKNİK ÇİZİMİ



MODEL A



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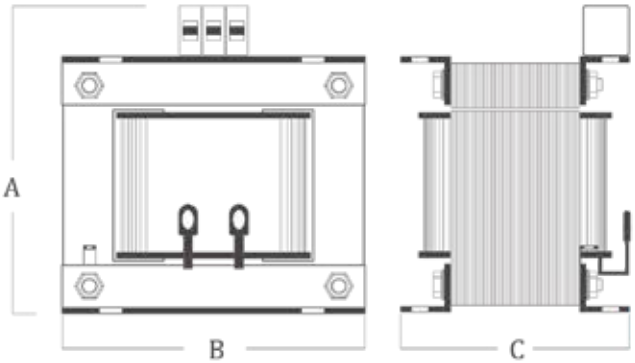
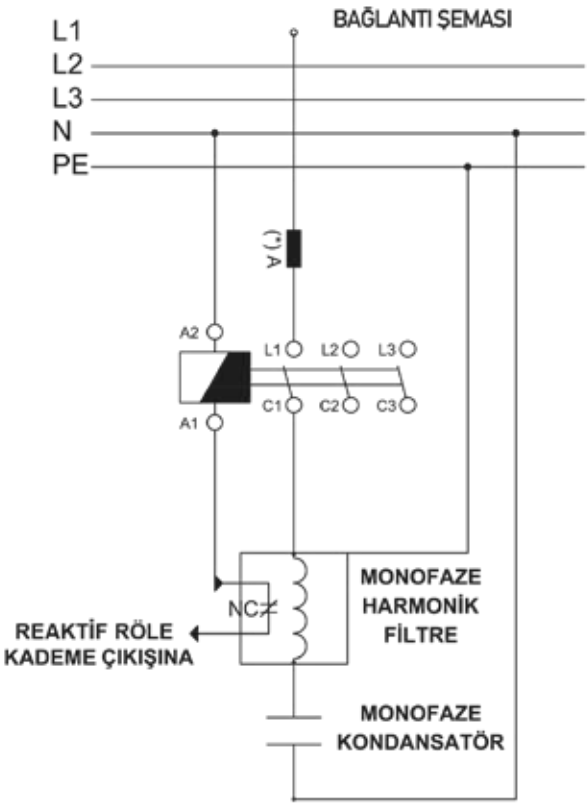


MODEL C



To determine harmonic filter selection;

First, measure harmonics (THDV and THDI) at various times and load conditions while the compensation system is OFF.

Harmonic Filter = P Factor	THDV	THDI
%5,7	<%2	>%25
%7	Other Conditions	Other Conditions
%14	>%4	<%15

The reactors listed in the catalog follow the standard series resonance frequencies as shown below.

Table of Series Resonance Frequencies of Reactors;

Harmonic Filter = P Factor	Resonance frequency corresponding to 50Hz*	THDI
%5,67	210Hz	424V
%7	189Hz	430V
%14	134Hz	465V

Accordingly:

- For P factor %5.67 and %7, minimum 440V capacitors must be used.
- For P factor %14, 525V capacitors are preferred.

Note: Once a series reactor is connected to the capacitor, terminal voltage on the capacitor will exceed nominal grid voltage.

When selecting capacitors, the following formula must be considered:

$$Uc = \frac{Un}{1-\frac{p}{100\%}}$$

U_n= nominal grid voltage
U_c= capacitor voltage

U_n= 400V
p=%7
U_c 430,1V must be above 430V

Reinforced harmonic filter reactors are produced on request for:

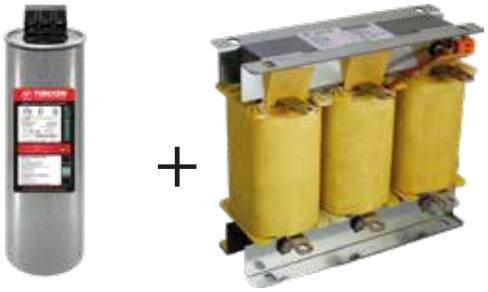
- P factors other than %5.67, %7, %14
- 60 Hz systems
- Non-standard capacitor types
- High voltage harmonic environments

Standard harmonic filters listed are suitable for facilities where 5th voltage harmonic <5% and total voltage harmonic <8%.
For higher distortions, reinforced filters must be used.

Important considerations for correct capacitor-reactor pairing:

- Resonance frequency of the system should match harmonic components
- Capacitor terminal voltage will be higher due to reactor—select accordingly
- Effective compensation power may differ due to high-voltage capacitors—calculate properly
- Reactors will increase temperature in the panel—ensure proper thermal management
- All reactors are vacuum impregnated with varnish and oven-dried: silent, vibration-free, highly insulated, and durable.

TIBCON HARMONIC FILTERS
CAPACITOR SELECTION TABLE



For Harmonic Filter (p=%7, 189 Hz)	440-450-460V Capacitor Order Code	480-525V Capacitor Order Code	525V Capacitor Order Code
HRT-73400,5	TBC1100		
HRT-73401	TBC1101		
HRT-73401,5	TBC1102		
HRT-73402,2	TBC1300		
HRT-73402,5	TBC1103		
HRT-73403,1			TBC1500
HRT-73403,73		TBC1400	
HRT-73404,4	TBC1301		
HRT-73405		TBC1401	TBC1501
HRT-73406,25			TBC1502
HRT-73406,66	TBC1302		
HRT-73407,5		TBC1402	TBC1503
HRT-73408,8	TBC1303		
HRT-734010		TBC1403	TBC1505
HRT-734011,1	TBC1304	TBC1404	
HRT-734012,5	TBC1305	TBC1402+1401	TBC1506
HRT-734013,3	TBC1306		
HRT-734015	TBC1303+TBC1302	TBC1406	TBC1507
HRT-734017,7	TBC1307		
HRT-734018,6		TBC1407	
HRT-734020	TBC1306+TBC1304	TBC1403+TBC1404	TBC1506+TBC1503
HRT-734022,2	TBC1308		
HRT-734025	TBC1309	TBC1409	TBC1509
HRT-734026,6	TBC1310		
HRT-734030	TBC1307+TBC1306	2XTBC1406	2XTBC1507
HRT-734035,5	2XTBC1307	TBC1406+TBC1404+TBC+1403	TBC1508+TBC1507
HRT-734037,5		2XTBC1407	2XTBC1508
HRT-734040	TBC1307+TBC1308	TBC1408+TBC1407	2XTBC1507+TBC1504
HRT-734044	2XTBC1308		TBC1509+TBC1508
HRT-734050	2XTBC1309	2XTBC1409	2XTBC1509
HRT-734053	2XTBC1310		
HRT-734060	TBC1310+TBC1308+TBC1304	4X1406	TBC1509+TBC1508+TBC1507
HRT-734066,6	3XTBC1308		
HRT-734071	4XTBC1307		
HRT-734075	3XTBC1309	3XTBC1409	3XTBC1509
HRT-734080	3XTBC1310		2XTBC1508+TBC1509
HRT-734088,8	4XTBC1308		
HRT-7340100	4XTBC1309	4XTBC1409	4XTBC1509

For Harmonic Filter (p=%5,67-210 Hz)	440-450-460V Capacitor Order Code	480-525V Capacitor Order Code	525V Capacitor Order Code
HRT-5,673400,5	TBC1100		
HRT-5,673401	TBC1101		
HRT-5,673401,5	TBC1102		
HRT-5,673402,2	TBC1300		
HRT-5,673402,5	TBC1103		
HRT-5,673403,1			TBC1500
HRT-5,673403,73		TBC1400	
HRT-5,673404,4	TBC1301		
HRT-5,673405		TBC1401	TBC1501
HRT-5,673406,25			TBC1502
HRT-5,673406,66	TBC1302		
HRT-5,673407,5		TBC1402	TBC1503
HRT-5,673408,8	TBC1303		
HRT-5,6734010		TBC1403	TBC1505
HRT-5,6734011,1	TBC1304	TBC1404	
HRT-5,6734012	TBC1305	TBC1402+1401	TBC1506
HRT-5,6734013,3	TBC1306		
HRT-5,6734015	TBC1303+TBC1302	TBC1406	TBC1507
HRT-5,6734017,7	TBC1307		
HRT-5,6734018,6		TBC1407	TBC1508
HRT-5,6734020	TBC1306+TBC1304	TBC1403+TBC1404	TBC1506+TBC1503
HRT-5,6734022,2	TBC1308		
HRT-5,6734025	TBC1309	TBC1409	TBC1509
HRT-5,6734026,6	TBC1310		
HRT-5,6734030	TBC1307+TBC1306	2XTBC1406	2XTBC1507
HRT-5,6734035,5	2XTBC1307	TBC1406+TBC1404+TBC+1403	TBC1508+TBC1507
HRT-5,6734037,5		2XTBC1407	2XTBC1508
HRT-5,6734040	TBC1307+TBC1308	TBC1408+TBC1407	2XTBC1507+TBC1504
HRT-5,6734044	2XTBC1308		TBC1509+TBC1508
HRT-5,6734050	2XTBC1309	2XTBC1409	2XTBC1509
HRT-5,6734053	2XTBC1310		
HRT-5,6734060	TBC1310+TBC1308+TBC1304	4X1406	TBC1509+TBC1508+TBC1507
HRT-5,6734066,6	3XTBC1308		
HRT-5,6734071	4XTBC1307		
HRT-5,6734075	3XTBC1309	3XTBC1409	3XTBC1509
HRT-5,6734080	3xTBC1310	3XTBC1408+TBC1406	3XTBC1508+TBC1509
HRT-5,6734088,8	4XTBC1308		
HRT-5,67340100	4XTBC1309	4XTBC1409	4XTBC1509

For Harmonic Filter (p=%14, 134 Hz)	525V Capacitor Order Code
HRT-143403,1	TBC1500
HRT-143405	TBC1501
HRT-143406,25	TBC1502
HRT-143407,5	TBC1503
HRT-1434010	TBC1504
HRT-1434012,5	TBC1506
HRT-1434015	TBC1507
HRT-1434020	TBC1508
HRT-1434025	TBC1507+TBC1503
HRT-1434030	TBC1506+TBC1507
HRT-1434040	2XTBC1508
HRT-1434050	3XTBC1507
HRT-1434060	3XTBC1508
HRT-1434075	2XTBC1509+TBC1508
HRT-14340100	6XTBC1507

SINGLE-PHASE HARMONIC FILTER (215-Hz P=%5,67- 189-Hz P=%7- 134-Hz P=%14)	
For Harmonic Filter	230V Capacitor Order Code
HRT-71230,5 / % 5,67- %7- %14	TBC1000
HRT-71231 / % 5,67- %7- %14	TBC1001
HRT-71231,5 / % 5,67- %7- %14	TBC1002
HRT-71232,5 / % 5,67- %7- %14	TBC1003
HRT-71233 / % 5,67- %7- %14	TBC1004
HRT-71235 / % 5,67- %7- %14	TBC1005
HRT-71237,5 / % 5,67- %7- %14	TBC1005+TBC1003
HRT-712310 / / % 5,67- %7- %14	2XTBC1005

To choose a harmonic filter reactor, measure harmonics (THDV and THDI) over different time intervals and load conditions while compensation system is off.
For P factor %5.67 and %7, use at least 440V capacitor.
For P factor %14, 525V capacitor is preferred.
Always analyze with a power analyzer and consult our technical team.
*For values not listed, please contact us.

TIBCON INDUCTIVE LOAD (SHUNT) REACTORS

GENERAL INFORMATION

SHUNT – INDUCTIVE LOAD REACTORS

Due to the limited nature of energy resources, it has become essential to implement measures to use energy efficiently and effectively. For facilities consuming power above a certain threshold, keeping reactive energy within certain limits is legally required, and exceeding these limits may incur penalties.

Controlling reactive energy is also crucial for maintaining the quality of the energy used in a facility. Compensation panels are used to maintain the balance between inductive and capacitive energy.

Among the key parameters to monitor in compensation systems are capacitive loads. Shunt reactors are connected in parallel to the system and function as inductive loads. These reactors can be manufactured in single-phase or three-phase versions, enabling the required inductive current—and therefore inductive power—to be drawn from the grid. By integrating these reactors into automatic compensation systems, excess capacitive power can be neutralized.

Devices such as UPS units, MV-XLPE cables, and LED-based lighting systems exhibit capacitive behavior. In facilities with such loads, shunt reactors are necessary to control the reactive power and maintain reactive ratios within acceptable limits.

Shunt reactors are devices that generate inductive effects. Thus, they are also called “Inductive Load Reactors” and are used in systems with high capacitive reactive energy to provide balance (compensation). Shunt reactors are designed to compensate for capacitive reactive energy generated by long underground power lines, UPSs, computers, electronic ballasts, and energy-saving LED lamps.

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Main issues caused by capacitive reactive energy in power systems:

- Incurs reactive energy penalties
- Reduces the efficiency and lifespan of equipment and machinery
- Limits the flow of active energy in the system
- Leads to unnecessary maintenance and repair costs

.

To solve these problems, shunt reactors should be connected in parallel with the system. They suppress unwanted capacitive effects by providing inductive load, thereby eliminating the problems mentioned above.

TIBCON manufactures standard shunt reactors and also customizes them according to the needs of the facility in terms of voltage and power. As modern systems increasingly use capacitive devices, it has become necessary to use shunt reactors alongside capacitors for effective compensation.

The size of the shunt reactor depends on the facility’s size and load profile. After conducting a proper analysis and considering cost, the most appropriate shunt reactor should be selected either with the help of SVC (Static Var Compensator) or added directly to the system in steps.

TIBCON SHUNT – INDUCTIVE LOAD REACTORS

GENERAL SPECIFICATIONS

SHUNT REACTOR GENERAL SPECIFICATIONS

Production Standards	EN 61558-1, EN 61558-2-20, EN 60289, EN 60076-6 – CE Certified
Nominal Power Ratings	Single-phase: 0.10–10 kVAr or Three-phase: 0.5–100 kVAr
Nominal Voltage	230 VAC .... 1000 VAC
Nominal Frequency	50 Hz (60 Hz optional)
Reactor Factor	p=%100
Inductance Tolerance	3%
Magnetic Core	High magnetic permeability silicon steel laminations – 0.35 mm
Windings	Electrolytic copper or aluminum foil/wire
Design	Air-gapped construction
Connections	Transformer terminal blocks, DIN rail terminals, SKP lugs, copper busbars
Electrical Protection	Terminal protection against overheating
Protection Class	IP00 (other protection classes available upon request in enclosures)
Insulation Class	Class F (155°C) or Class H (180°C)
Impregnation	Up to 95% non-condensing (DIN 40040)
Relative Humidity	%95 Yoğunlaşmayan (DiN 40040)
Installation Altitude	O- 2000 m
Ambient Temperature	-10°C .... +40°C
Storage Temperature	-10°C ..... +70°C
Frequency	Designed according to system voltage and power requirements
	Special designs available upon request

TIBCON SHUNT – INDUCTIVE LOAD REACTORS

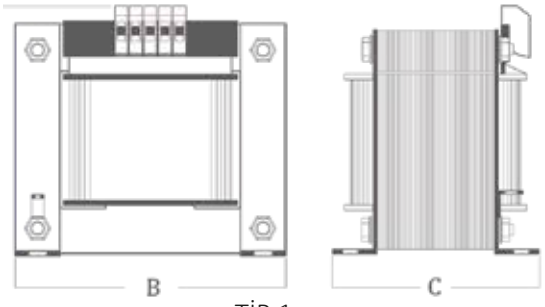
TECHNICAL SPECIFICATIONS

230V SINGLE-PHASE SHUNT REACTORS

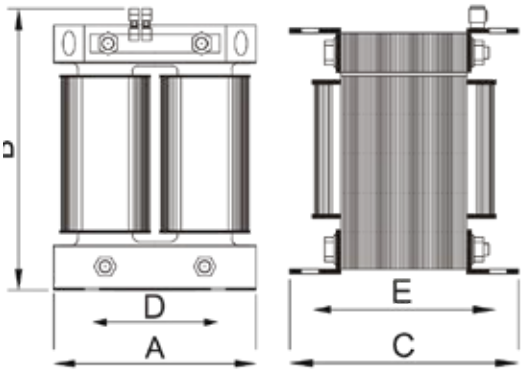
Order Code	Product Code	Product Description	Qc (kVAr)	Voltage (V)	Current (A)	Thermal Protection	Ln (mH)	Type	A	B	C	Connection	Weight (kg)
TBSR5401	ŞM-230,5	SINGLE-PHASE SHUNT REACTOR	0,5	230	2,17	•	336	TİP1	136	133	106	Klemens	3,5
TBSR5402	ŞM-231	1 KVAR SINGLE-PHASE SHUNT REACTOR	1	230	4,34	•	168	TİP1	145	150	130	Klemens	6,5
TBSR5403	ŞM-231,5	1,5 KVAR SINGLE-PHASE SHUNT REACTOR	1,5	230	6,52	•	112	TİP1	145	150	150	Klemens	9
TBSR5404	ŞM-231,66	1,66 KVAR SINGLE-PHASE SHUNT REACTOR	1,66	230	7,2	•	102	TİP1	145	150	150	Klemens	9
TBSR5406	ŞM-232,5	2,5 KVAR SINGLE-PHASE SHUNT REACTOR	2,5	230	10,85	•	67	TİP1	175	192	160	Klemens	15
TBSR5407	ŞM-233	3 KVAR SINGLE-PHASE SHUNT REACTOR	3	230	13,04	•	56	TİP1	175	192	170	Klemens	17
TBSR5408	ŞM-233,5	3,3 KVAR SINGLE-PHASE SHUNT REACTOR	3,3	230	14,3	•	51	TİP1	175	192	170	Klemens	17
TBSR5409	ŞM-235	5 KVAR SINGLE-PHASE SHUNT REACTOR	5	230	21,73	•	33,8	TİP2	210	260	180	Pabuç	20
TBSR5410	ŞM-236,67	6,67 KVAR SINGLE-PHASE SHUNT REACTOR	6,67	230	29	•	25,3	TİP2	210	260	190	Pabuç	22
TBSR5411	ŞM-237,5	7,5 KVAR SINGLE-PHASE SHUNT REACTOR	7,5	230	32,6	•	22,5	TİP2	210	260	200	Pabuç	25
TBSR5412	ŞM-2310	10 KVAR SINGLE-PHASE SHUNT REACTOR	10	230	43,4	•	16,8	TİP2	250	310	210	Pabuç	30
TBSR5413	ŞM-2315	15 KVAR SINGLE-PHASE SHUNT REACTOR	15	230	65,2	•	11,3	TİP2	280	380	230	Pabuç	40
TBSR5414	ŞM-2316,67	16,67 KVAR SINGLE-PHASE SHUNT REACTOR	16,67	230	72,5	•	10,3	TİP2	280	380	240	Pabuç	45
TBSR5415	ŞM-2320	20 KVAR SINGLE-PHASE SHUNT REACTOR	20	230	87	•	8,4	TİP2	320	400	170	Pabuç	50

Products without specified values are manufactured upon request. Please contact us for details

Technical Drawing

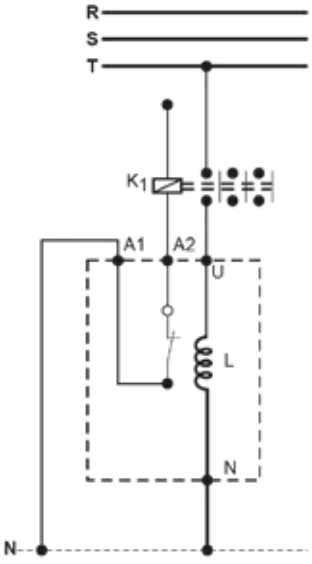


TİP 1



7.5 - 10 - TİP 230V ŞÖNT

Connection Diagram



TIBCON SHUNT – INDUCTIVE LOAD REACTORS

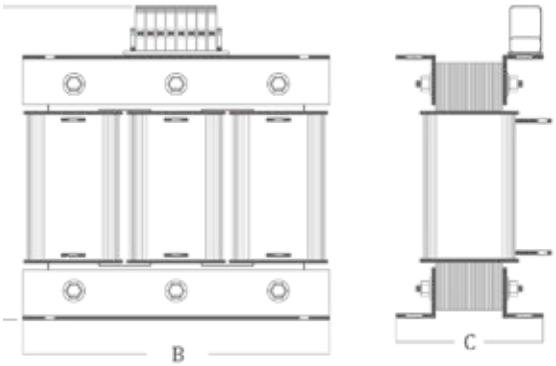
TECHNICAL SPECIFICATIONS

400V THREE-PHASE SHUNT REACTORS

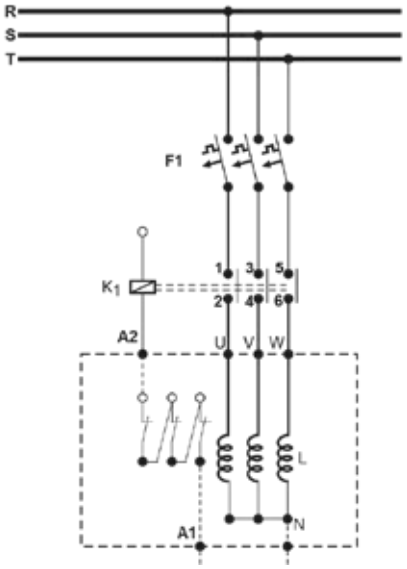
Order Code	Product Code	Product Description	Qc (kVAr)	Voltage (V)	Current (A)	Thermal Protection	Ln (mH)	Type	A	B	C	Connection	Weight (kg)
TBSR5602	ŞT-400,5	0,5 KVAR THREE-PHASE SHUNT REACTOR	0,5	400	0,72	•	102	TİP1	145	125	125	Klemens	2,3
TBSR5603	ŞT-401	1 KVAR THREE-PHASE SHUNT REACTOR	1	400	1,44	•	505	TİP1	180	180	140	Klemens	7,8
TBSR5604	ŞT-401,5	1,5 KVAR THREE-PHASE SHUNT REACTOR	1,5	400	2,16	•	336	TİP1	180	180	150	Klemens	9,5
TBSR5605	ŞT-402	2 KVAR THREE-PHASE SHUNT REACTOR	2	400	2,88	•	255	TİP1	240	230	160	Klemens	11,6
TBSR5606	ŞT-402,5	2,5 KVAR THREE-PHASE SHUNT REACTOR	2,5	400	3,6	•	202	TİP1	240	230	160	Klemens	12
TBSR5607	ŞT-403	3 KVAR THREE-PHASE SHUNT REACTOR	3	400	4,32	•	170	TİP1	240	230	180	Klemens	17
TBSR5608	ŞT-405	5 KVAR THREE-PHASE SHUNT REACTOR	5	400	7,2	•	101	TİP1	280	300	170	Klemens	27
TBSR5609	ŞT-407,5	7,5 KVAR THREE-PHASE SHUNT REACTOR	7,5	400	10,8	•	68	TİP2	280	300	200	Klemens	36
TBSR5611	ŞT-4010	10 KVAR THREE-PHASE SHUNT REACTOR	10	400	14,43	•	51	TİP2	340	350	180	Klemens	44
TBSR5612	ŞT-4012,5	12,5 KVAR THREE-PHASE SHUNT REACTOR	12,5	400	18,04	•	41	TİP2	340	350	200	Klemens	55
TBSR5613	ŞT-4015	15 KVAR THREE-PHASE SHUNT REACTOR	15	400	21,65	•	34	TİP2	340	350	220	Klemens	65
TBSR5614	ŞT-4020	20 KVAR THREE-PHASE SHUNT REACTOR	20	400	28,86	•	25,5	TİP2	380	410	230	Pabuç	81
TBSR5615	ŞT-4025	25 KVAR THREE-PHASE SHUNT REACTOR	25	400	36,08	•	20,4	TİP2	380	410	240	Pabuç	102
TBSR5617	ŞT-4030	30 KVAR THREE-PHASE SHUNT REACTOR	30	400	43,2	•	16,8	TİP2	440	480	270	Pabuç	125
TBSR5620	ŞT-4040	40 KVAR THREE-PHASE SHUNT REACTOR	40	400	57,6	•	12,6	TİP2	440	480	300	Pabuç	141
TBSR5621	ŞT-4050	50 KVAR THREE-PHASE SHUNT REACTOR	50	400	72,17	•	10,2	TİP2	500	480	320	Pabuç	180

* Products without specified values are manufactured upon request. Please contact us for more information

Technical Drawing



Connection Diagram



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