DC Tachometer generator TDP 0,7 XPY

TDP 0,7 XPY; flange design B5
TDP 0,7 XPY; foot design B3

Installation and Operating Manual

BALDOR • RELIANCE

February 2020

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Important:
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Note! The manufacturer of these products, Baldor Electric Company became ABB Motors and Mechanical Inc. on March 1, 2018. Nameplates, Declaration of Conformity and other collateral material may contain the company name of Baldor Electric Company and the brand names of Baldor-Dodge and Baldor-Reliance until such time as all materials have been updated to reflect our new corporate identity.

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Section 1
General Information

1.1 Getting Assistance from ABB

For technical assistance, contact your local ABB representative. Before calling, review the troubleshooting section later in this manual.

1.2 Information about the Operating and Assembly Instructions

These operating and assembly instructions provide important instructions for working with the TDP 0,7 XPY. They must be carefully read prior to starting all tasks, and the instructions contained herein must be followed.

The device is referred as TDP 0,7 XPY in the following documentation.
In addition, applicable local regulations for the prevention of industrial accidents and general safety regulations must be complied with.

1.3 Scope of delivery

The scope of supply includes the TDP 0,7 XPY and the operating and assembly instructions.

1.4 Explanation of symbols

Warnings are indicated by symbols in these operating and assembly instructions. The warnings are introduced by signal words that express the scope of the hazard. To prevent accidents, personal injuries and material damage it is imperative to observe the information provided and proceed with due care and attention at all times.

WARNING: Indicates a possibly dangerous situation that can result in death or serious injury if it is not avoided.

CAUTION: Indicates a possibly dangerous situation that can result in minor injury if it is not avoided. It also indicates a possibly dangerous situation that can result in material damage if it is not avoided.

NOTES: Indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

1.5 Safety Notice

This equipment contains high voltage! Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation and maintenance of electrical equipment.

WARNING: Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.
WARNING: Disconnect all electrical power from the motor windings and accessory devices before disassembling of the motor. Electrical shock can cause serious or fatal injury.
WARNING: Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that all grounding instructions have been followed. Electrical shock can cause serious or fatal injury.
WARNING: Avoid extended exposure to machinery with high noise levels. Be sure to wear ear protective devices to reduce harmful effects to your hearing.
WARNING: Surface temperatures of motor enclosures may reach temperatures which can cause discomfort or injury to personnel accidentally coming into contact with hot surfaces. When installing, protection should be provided by the user to protect against accidental contact with hot surfaces. Failure to observe this precaution could result in bodily injury.
WARNING: Guards must be installed for rotating parts to prevent accidental contact by personnel. Accidental contact with body parts or clothing can cause serious or fatal injury.
WARNING: This equipment may be connected to other machinery that has rotating parts or parts that are driven by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt to install operate or maintain this equipment.
WARNING: Do not by-pass or disable protective devices or safety guards. Safety features are designed to prevent damage to personnel or equipment. These devices can only provide protection if they remain operative.
WARNING: Be sure the load is properly coupled to the motor shaft before applying power. The shaft key must be fully captive by the load device. Improper coupling can cause harm to personnel or equipment if the load decouples from the shaft during operation.
WARNING: Use proper care and procedures that are safe during handling, lifting, installing, operating and maintaining operations. Improper methods may cause muscle strain or other harm.
WARNING: Pacemaker danger – Magnetic and electromagnetic fields in the vicinity of current carrying conductors and permanent magnet motors can result in a serious health hazard to persons with cardiac pacemakers, metal implants, and hearing aids. To avoid risk, stay way from the area surrounding a permanent magnet motor.

WARNING: Before performing any motor maintenance procedure, be sure that the equipment connected to the motor shaft cannot cause shaft rotation. If the load can cause shaft rotation, disconnect the load from the motor shaft before maintenance is performed. Unexpected mechanical rotation of the motor parts can cause injury or motor damage

WARNING: Motors with S2 30 Minute Rating Without Coolant Flow are thermally protected. It is intended that this duty and operation will permit repositioning of equipment in circumstances where interruption of coolant flow may be necessary. To ensure motors do not exceed the permissible maximum surface temperature for Group I equipment according to IEC 60079–0 they must be operated according to the duty cycle. In addition, it is critical the installation, use and maintenance allows free flow of air around the motors. Build–up of material such as coal dust that could also inhibit circulation must be removed before operation with this duty cycle. In addition, it is necessary to connect the motor thermal protection devices which act as a secondary measure to provide additional assurance that the permissible maximum surface temperature is not exceeded.

WARNING: Thermostat contacts automatically reset when the motor has slightly cooled down. To prevent injury or damage, the control circuit should be designed so that automatic starting of the motor is not possible when the thermostat resets.

CAUTION: To prevent premature equipment failure or damage, only qualified maintenance personnel should perform maintenance.

CAUTION: Do not over–lubricate motor as this may cause premature bearing failure.

CAUTION: Do not lift the motor and its driven load by the motor lifting hardware. The motor lifting hardware is adequate for lifting only the motor. Disconnect the load (gears, pumps, compressors, or other driven equipment) from the motor shaft before lifting the motor.

CAUTION: If eye bolts are used for lifting a motor, be sure they are securely tightened. The lifting direction should not exceed a 20° angle from the shank of the eye bolt or lifting lug. Excessive lifting angles can cause damage.

CAUTION: To prevent equipment damage, be sure that the electrical service is not capable of delivering more than the maximum motor rated amps listed on the rating plate.

CAUTION: If a Motor Insulation test (High Potential Insulation test) must be performed, disconnect the motor from any Speed Control or drive to avoid damage to connected equipment.

1.6 Responsibility of the owner

The TDP 0,7 XPY is used in commercial applications. Consequently the owner of the TDP 0,7 XPY is subject to the legal occupational safety obligations, and subject to the safety, accident prevention, and environmental protection regulations that are applicable for the TDP 0,7 XPY area of implementation.

1.7 Personnel selection and qualification; basic obligations

- All work on the TDP 0,7 XPY must only be carried out by qualified personnel. Qualified personnel includes persons, who, through their training, experience and instruction, have been authorized by the persons responsible for the system to carry out the required work and are able to recognize and avoid potential hazards.
- Qualified personnel shall follow electrical safety standards including National Electrical Code, NEMA MG-2, IEC standards or local codes during selection, installation and use of this product.
- The responsibility for assembly, installation, commissioning and operation must be clearly defined. The obligation exists to provide supervision for trainee personnel.

1.8 Intended use

Series TDP 0,7 XPY are used as feedback devices for measuring systems monitoring speed of electrical and mechanical drives, hoisting, gear and conveying machines as example.

Claims of any type due to damage arising from non-intended use are excluded; the owner bears sole responsibility for non-intended use.

1.9 Non-intended use

WARNING! Danger of death, physical injury and damage to property in case of non-intended use of the TDP 0,7 XPY!

The following areas of use are especially forbidden:

- **in environments where there is an explosive atmosphere.**
- **use in environments with radioactive radiation.**
- **use on ships.**
- **for medical purposes.**
- **fastening transport or lifting tackle to the device,for example a crane hook to lift a motor.**
- **fastening packaging components to the device,for example ratchet straps, tarpaulins etc..**
- **using the device as a step,for example by people to climb onto a motor.**

1.10 Installation and Operation

- The operating and assembly instructions must always be kept ready-to-hand at the place of use of the TDP 0,7 XPY.
- In addition to the operating and assembly instructions, generally valid legal and other binding regulations on accident prevention and environmental protection must be observed and communicated.
- The respective applicable national, local and system-specific provisions and requirements must be observed and communicated.
- The operator is obliged to inform personnel on special operating features and requirements.
- Prior to commencing work, personnel working with the tacho-generator must have read and understood the chapter 2.
- The nameplate and any prohibition or instruction symbols applied on the tacho-generator must always be maintained in a legible state.
- Do not undertake any mechanical or electrical modifications to the tacho-generator, except for those expressly described in this operating and assembly instructions.
- Repairs may only be undertaken by the manufacturer or a center or person authorized by the manufacturer.

Section 2
Assembly and Installation

2.1 Assembly

WARNING: At assembly, dismantling and other work to the TDP 0.7 XPY the basic safety instructions contained in this manual must be observed.

WARNING: The assembly and the dismantling of the measuring system must only be carried out by qualified personnel.

WARNING: Do not use a hammer or similar tool during installing, disassembly or other work on the TDP 0,7 XPY due to the risk of damage occurring to the bearings or coupling.

2.2 Installation Work

2.2.1 Installation and commissioning

CAUTION: It is the owners responsibility to ensure that all moving parts are properly safeguarded and ensure that the machine is safe to operate!

CAUTION: Observe the maximum permissible voltage when repeating the winding test (contact the manufacturer).

CAUTION: It is essential to prevent the ingress of oil or grease into the commutator area! Oil mist as well as touching carbon brushes with oily fingers will cause the carbon brushes to wear significantly; this in turn will lead to the commutator becoming greasy and short-circuits between the segments.

1. Use a zero-play coupling. The armature must rotate easily; the carbon brushes must sit properly in the brush holders.
2. Ensure precisely centred assembly. Angular misalignment and parallel displacement lead to additional harmonics. Align added device referring to a harmonics oscillogram (<5‰). Fit and align overhanging devices with due care and attention. Observe maximum permissible radial eccentricity 0.05 mm. Do not allow radial or axial forces to act on the tacho-generator shaft.
3. Secure machine using flange or foot.

   Mount the machine securely without distortion and not subject to vibration. Securely fasten the feet or flange using standard screws and washers in all of the through holes. It is important to ensure the correct property class, size and length of engagement on the fastening side (in accordance with VDI 2230 Blatt 1) so that the entire system remains securely and reliably mounted under all operating statuses. The thread engagement, its stability and strength on the fastening side must be guaranteed at all times.

   The screws must be tightened to the appropriate torque for the property class and thread; screws must not become loose when the machine is in operation or at a standstill. Use a torque wrench. Regularly check the fastening screws are seated correctly in accordance with the inspection and maintenance schedule. Use only flexible couplings; align and adjust the tacho-generator exercising due care and attention.

   Fit coupling components or other fastenings with due care and attention. Support the opposite end of the shaft (blows will damage the bearings).

   If the second shaft is not used secure the key permanently to ensure it cannot be thrown out of the keyway.
4. Connections in the terminal enclosure.
   Check the load against the technical data detailed on the nameplate. Please note: Take account of surge protectors for downstream devices, if these are connected to the output voltage of the tacho-generator. The output voltage of the tacho-generator increases at a given (linear) relationship in proportion to the speed.
   - Connect according to circuit diagram (see wiring diagram).
   - To guarantee a safe electrical connection the cross-section of the conductors must be sized in accordance with the rated current as detailed on the nameplate.
   - Ensure any unused cable glands and the terminal box are sealed dust and water-tight
   - Create a safe earth connection!

Before closing the terminal box you must ensure that

- The connections have been terminated according to the wiring diagram.
- All connections in the terminal box have been securely tightened.
- All minimum clearance values have been maintained (greater than 8 mm up to 500 V, greater than 10 mm up to 750 V)
- The inside of the terminal box is clean.
- Unused cable glands are sealed and the screw plugs including the seals are tightened securely.
- The gasket seal is clean and properly glued in the lid of the terminal box; ensure all sealing surfaces are in a proper condition to guarantee the degree of protection.
- The rating data match the data detailed on the nameplate.

5. Remove any transport locks before commissioning.

2.2.2 Removal from Installation

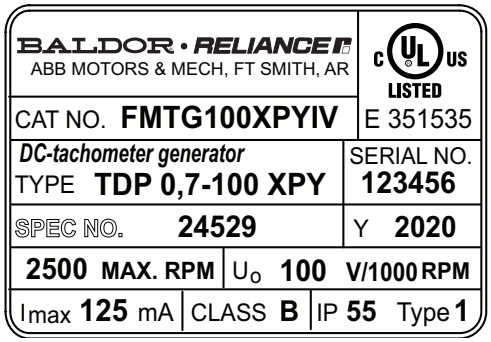
Observe and adhere to all safety information contained in this manual.

- Removal of the TDP 0,7 XPY from the host machine must be carried out by qualified personnel only.
- Remove all electrical connection cables of the TDP 0,7 XPY before removal from its mounting.
- Shut down and ensure the host machine cannot be restarted.
- Turn off and isolate the power supply; turn off and isolate the power supply to any additional or auxiliary circuits.
- Ensure adjacent live components are insulated and safeguarded.
- Examine components for damage and broken edges (for example risk of cuts from broken off foot).
- Exercise due care and attention when removing coupling parts and fastenings; support the opposite end of the shaft (blows will damage the bearings). Coat the shaft with a thin layer of oil and seal with screw cap. Ensure the terminal box and cable glands are sealed dust and water-tight; ensure the degree of protection (see nameplate) is achieved and guaranteed for transport.
- Observe and adhere to transport information (Section 7)!
- Ensure that the packaging (carton + palette) used to transport the machine is correctly sized and that the machine is secured by the packaging in such a manner that forces resulting from the weight of the machine during transport cannot cause any damage to the machine, to neighboring parts or injury to personnel! Use transport locks to reduce the load acting on the bearings.
- Tacho-generator is not to be dissassembled. Only fully assembled tacho-generators may be returned for repairs / goodwill / warranty. Refer to Section 7.5.

3.1 Name Plate

The figure below shows an example of a name plate with nominal values.

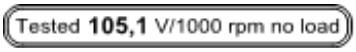
Figure 3-1 Name plate



The name plate is located on the side of the housing and contains the following information:

- Manufacturer, address, UL mark
- Item-No. (ID)
- Type, year of construction
- Serial number (S/N)
- Degree of protection (IP)
- No load voltage (V/1000 rpm)
- Maximum speed (rpm)
- Current output (mA)
- Class insulation

The figure below shows an example of an additional type plate with real measured values.



3.2 Type key

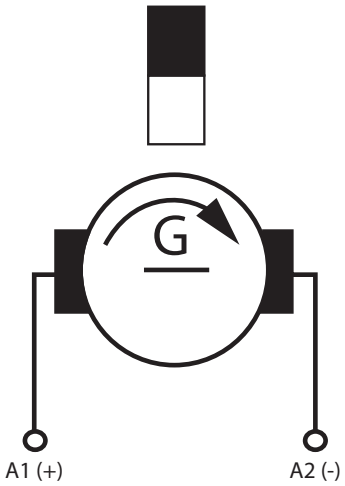
	TDP 0,7	50	XPY
DC tachometer generator			
No load voltage			
50: 50 VDC ± 6 %			
100: 100 VDC ± 6 %			
Series			
XPY: B5 (with flange) or B3 (with foot)			

3.3 Electrical and mechanical data

Specification	**Value**	
Speed	max. 5,000 rpm	max. 2,500 rpm
No load voltage (1,000 rpm)	50 VDC ± 6 %	100 VDC ± 6 %
Current	max. 250 mA (nominal: 80 mA)	max. 125 mA (nominal: 40 mA)
Degree of protection	IP55, Type 1	
Temperature range	-25°C … + 75° C	
Weight	Construction type B5 Construction type B3	approximately 2.5 kg approximately 2.9 kg

4.1 Block Diagram

Figure 4-1 Block diagram, clockwise rotation



4.2 Short description

The TDP 0,7 XPY consists of a permanent magnet stator for excitation and a rotor from which DC voltage is drawn via carbon brushes. The rotating rotor generates a DC voltage at a given linear relationship in proportion to its speed.

4.3 Connections

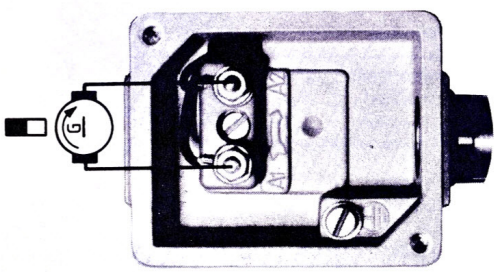
The terminal box is fitted with cable glands. Suitable cables are necessary to maintain the degree of protection. (See Section 8 Dimension Drawings).

Electrical connection:

Clockwise rotation: A1 terminal positive
A2 terminal negative

- Suitable connection cable to maintain degree of protection

Fit cover plate and terminal box lid, machine is ready for operations!



- use only copper cables
- use +60°C supply wires
- use 24AWG (0.2mm²) wires or higher for connection.

- Please see also page 3 of the UL report.

Section 5
Inspections

5.1 Safety instructions

WARNING: Skilled technical staff only are permitted to inspect the TDP 0,7 XPY and its installation.

WARNING: Observe the safety instructions contained in this manual when inspecting or working on the TDP 0,7 XPY.

5.2 Maintenance information

The TDP 0,7 XPY is maintenance-free. However, to guarantee optimum fault-free operations we recommend that you carry out the following inspections.

The inspection work described in this section must be carried out by skilled technical staff only. We remind you of your obligation to observe and adhere to all operating and owner-relevant accident prevention regulations, laws regarding the safeguarding of machinery and plant as well as application and country-specific regulations, laws and standards.

5.3 Inspection schedule

NOTE: Do not use a hammer or similar tool during installing, disassembly or other work on the TDP 0,7 XPY due to the risk of damage occurring to the bearings or coupling.

Interval	Inspections
Regularly	Check fastening screws are seated correctly
After approx. 16 000 – 20 000 hours of operation or higher levels of continuous load	Check carbon brushes; blow carbon brush dust out of the machine using dry, oil-free compressed air; check ease of movement. When changing carbon brushes (service life approx. 10 000 – 20 000 operating hours depending on environmental conditions and speed) ensure the new brushes are of the same quality and type.
Every 48 month	Check ball bearings for noise, running smoothly. Service life approx. 20 000 hours (lubricated for life); however, service life depends on speed, environmental conditions and load. Observe removal from installation instructions!
Regularly (depending on degree of soiling)	Cleaning: Blow-clean the machine using dry, oil-free compressed air. Do not use cleaning agents that damage the coating. Do not use inflammable cleaning agents.
Regularly	Check coating. If the protective coating is sufficiently damaged, repaint to prevent risk of corrosion (recommended).
If the TDP 0,7 XPY has not been in use for a long time (more than 6 months).	Check the insulation resistance of the windings (greater approximate 1-5 mega-ohm). To measure the insulation resistance disconnect all outgoing lines from the generator. Contact the manufacturer if the resistance reading is less than 1 mega-ohm.

6.1 Fault Table

Faults	Possible cause	Remedy
Voltage to low	Wrong speed	Speed measurement control
	Winding short	Contact manufacturer
	Maximum permissible current is exceeded	Reduce current
	Irreversible damage the magnets (aging)	Magnets magnetize new (consult manufacturer).
Voltage values at different rotation unequal	Neutral zone adjusted.	Contact manufacturer
	Bias excitation field by armature reaction.	Contact manufacturer
	Reversion, tilt the brush in the holder.	Contact manufacturer
Harmonics	Burn marks on the commutator, for example by short circuits.	Cause for short circuits and repair
	Coupling or assembly errors (misalignment and parallel misalignment).	Correct the mounting mistake
	System-related vibrations and resonance	Possible causes, contact the manufacturer.
Rotor rotating hard	Armature short circuit, defective storage	Decouple machine to look again, a hard place? Contact the manufacturer
Grinding noise	Carbon brush holder from fallen.	Brush back into holder, avoid strong vibrations.
	Mounting error / coupling problem	Mounting precision check
Bearing makes noise or is jammed **Note: Exchange of the bearings only by the manufacturer.**	Corroded bearings	Replace bearing by manufacturer
	Insufficient lubrication.	Contact the manufacturer
	Too little/much bearing play.	Replace bearings; contact the manufacturer
	Grind marks in the bearing track, scoring.	Replace bearings; contact the manufacturer
	Bearing jammed or distorted	Check bearing bore; contact the manufacturer
	Seals rub	Replace seal. Please contact the manufacturer
	Insufficient lubrication	Please contact the manufacturer
	Bearing corroded	Please contact the manufacturer.
	Too little bearing play	Please contact the manufacturer
	Coupling pushes or pulls	Re-align machine
	Belt tensioned too tightly	Adjust belt pulley in line with specifications.
	Bearings jammed or distorted	Contact the manufacturer

Faults	Possible cause	Remedy
Heavy vibration	Rotor imbalance, rotor not round, shaft distorted	Please contact the manufacturer
	Incorrect alignment	Align set of machines; check coupling
	Imbalance with the coupled prime mover	Rebalance the coupled prime mover
	Shocks from coupled prime mover	Check prime mover
	Resonance in the foundations	Strengthen foundations following consultation with the manufacturer
	Changes in the foundation	Following consultation with the manufacturer determine the cause, eliminate error and realign the machine.
Carbon brushes wearing excessively	Brush contact resistance too high – badly formed patina (brush contact face - commutator contact face) as a result of the air being too dry.	Change condition of circulating air (remedy lack of moisture; avoid dust in ambient air).
	Brush pressure too high	Contact the manufacturer.
	Grease on brush contact face	Clean contact face (contact the manufacturer)
	Heavy vibration	* See above.
Surface temperature too high (>100 °C)	Operated under short-circuit conditions	Check device; please contact the manufacturer.
Other faults		Please contact the manufacturer.
Contact your ABB representative if none of the remedies listed above provides a solution.		

Section 7
Transport, packaging and storage

7.1 Safety information concerning transport

CAUTION: Material damage caused by improper transport.

- **Do not throw - risk of breakage**
- **Keep dry**
- **Do not expose to heat above 40 ºC or direct sunlight**

7.2 Goods inward inspection

Check the delivery immediately upon receipt for transit damage or short delivery.
Inform the carrier immediately on receipt if you determine that damage has occurred during transit (take photos as proof).

7.3 Packaging (disposal)

The packaging is not taken back; dispose of according to the respective valid statutory provisions and local regulations.

7.4 Storing packages (devices)

- Keep dry! Keep packages dry and free from dust, protect from moisture.
- Protect against heat! Protect packages from heat abover 40º C and direct sunlight.
  If you intend to store the device for a longer period of time (> 6 months) we recommend you use protective packaging (with desiccant).

NOTES: Turn the shaft of the TDP 0.7 XPY every 6 month to prevent the bearing grease solidifying!

7.5 Warranty Policy

Tachometer Warranty is 12 months from the date of manufacture as indicated on the product nameplate. A 6 month shelf life will be allowed based on date of purchase. All warranty claims are subject to verification by inspection of the manufacture. Warranty covers material and workmanship only. All returned tachometers are subject to a $350.00 inspection fee.

Tachometers:

Catalog #	Spec #	Description
CMTG50XPYIV	ID 24653	TDP 0,7-50 XPY (B5, flange)
CMTG100XPYIV	ID 24513	TDP 0,7-100 XPY (B5, flange)
FMTG50XPYIV	ID 24654	TDP 0,7-50 XPY (B3, foot)
FMTG100XPYIV	ID 24529	TDP 0,7-100 XPY (B3, foot)

Requires an ABB RA (Return Authorization #) This can be issued by your local Sales support office. You can contact DC motor product marketing for additional support via e-mail at usengineeredproductsanddcmotors@abb.com

Please Return to:

ABB Tachometer Inspection Center
744 Noah Drive
Ste. 113-357
Jasper GA 30143

7.6 Disposal

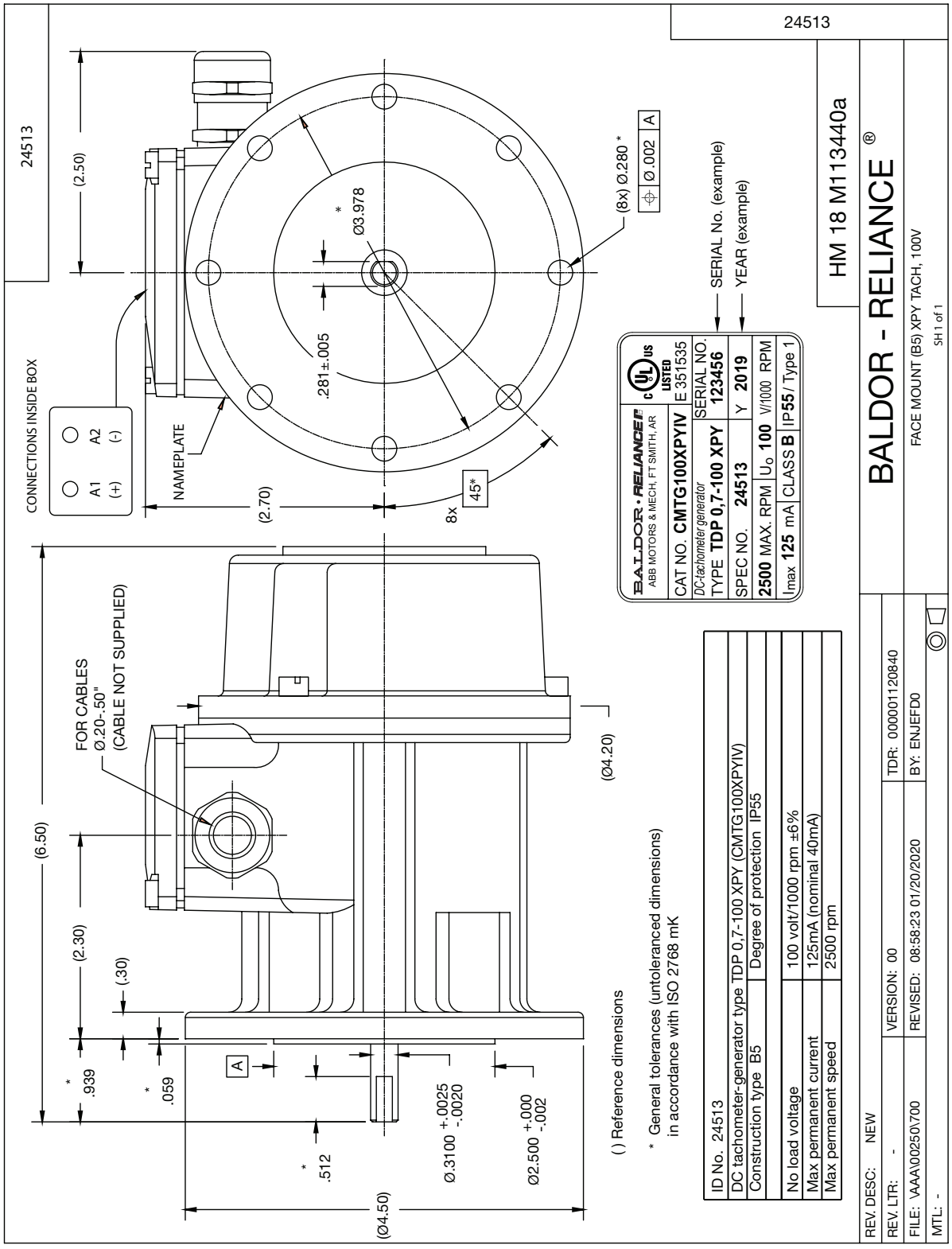
The manufacturer is not obligated to take back electronics waste.

The TDP 0.7 XPY consists of hybrid components, and in part must be disposed of as special waste (electronic scrap) according to country-specific legislation.

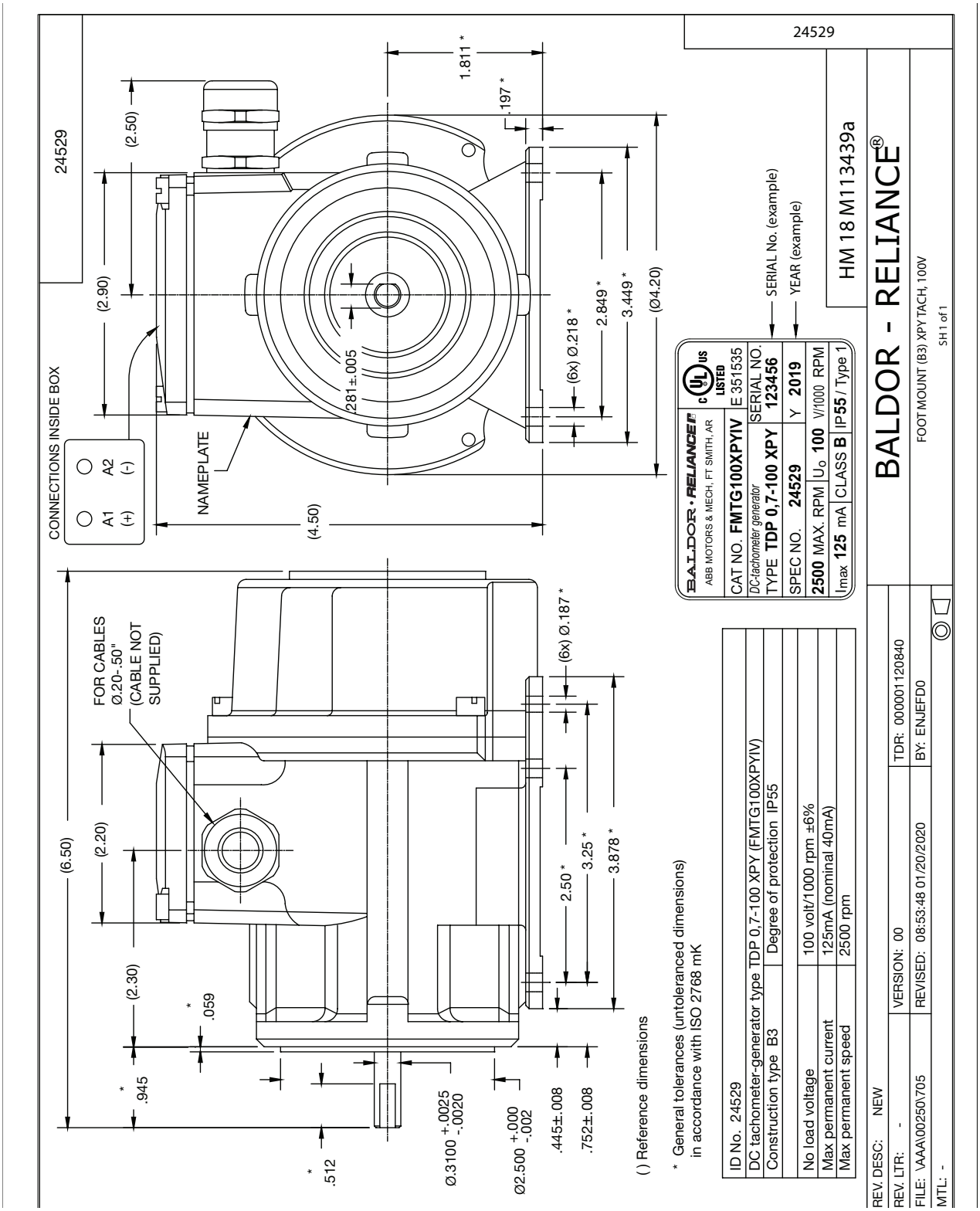
Local municipal authorities or specialized disposal companies provide information on environmentally responsible disposal.

8.1 Dimension drawings

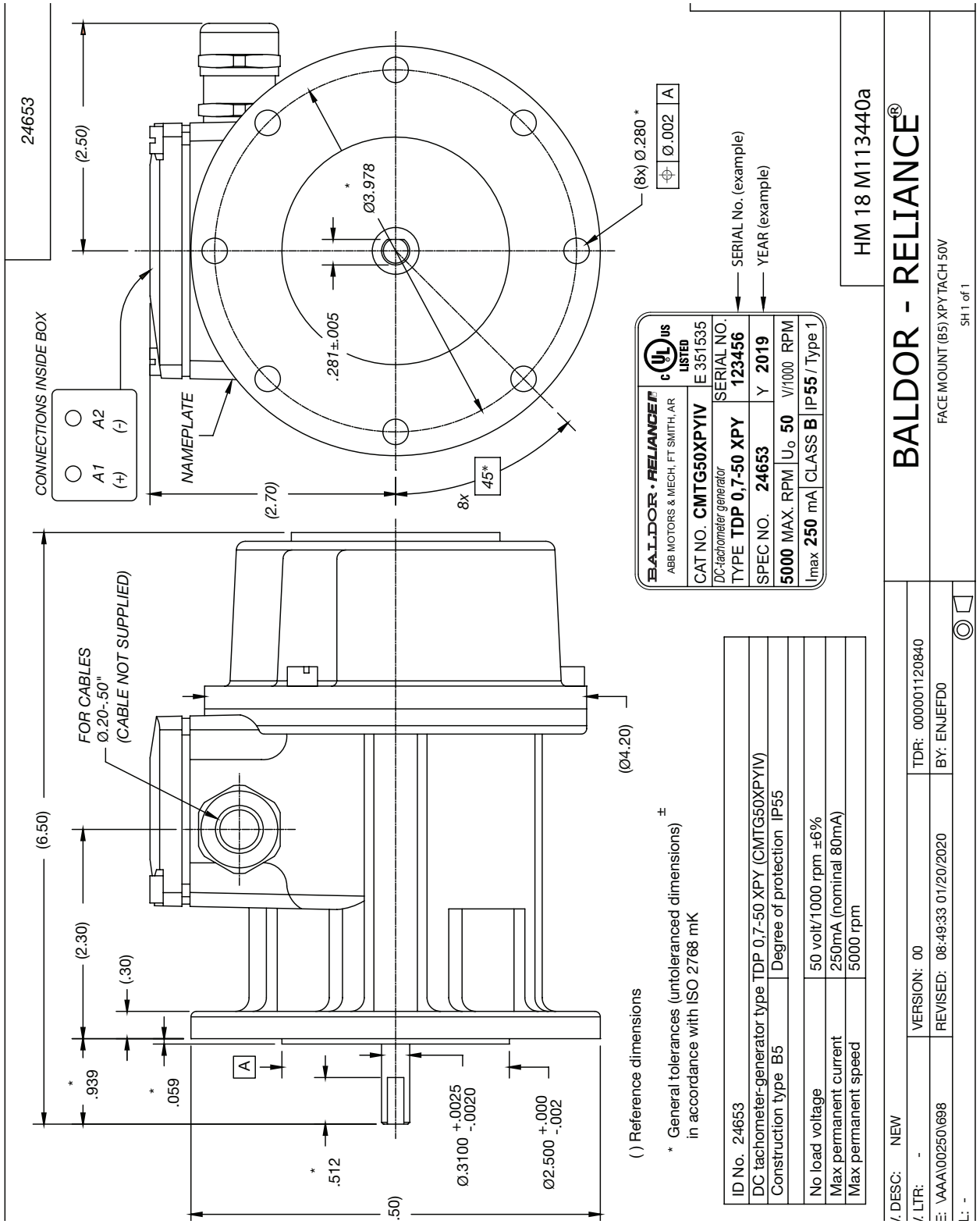
8.1.1 Face mount



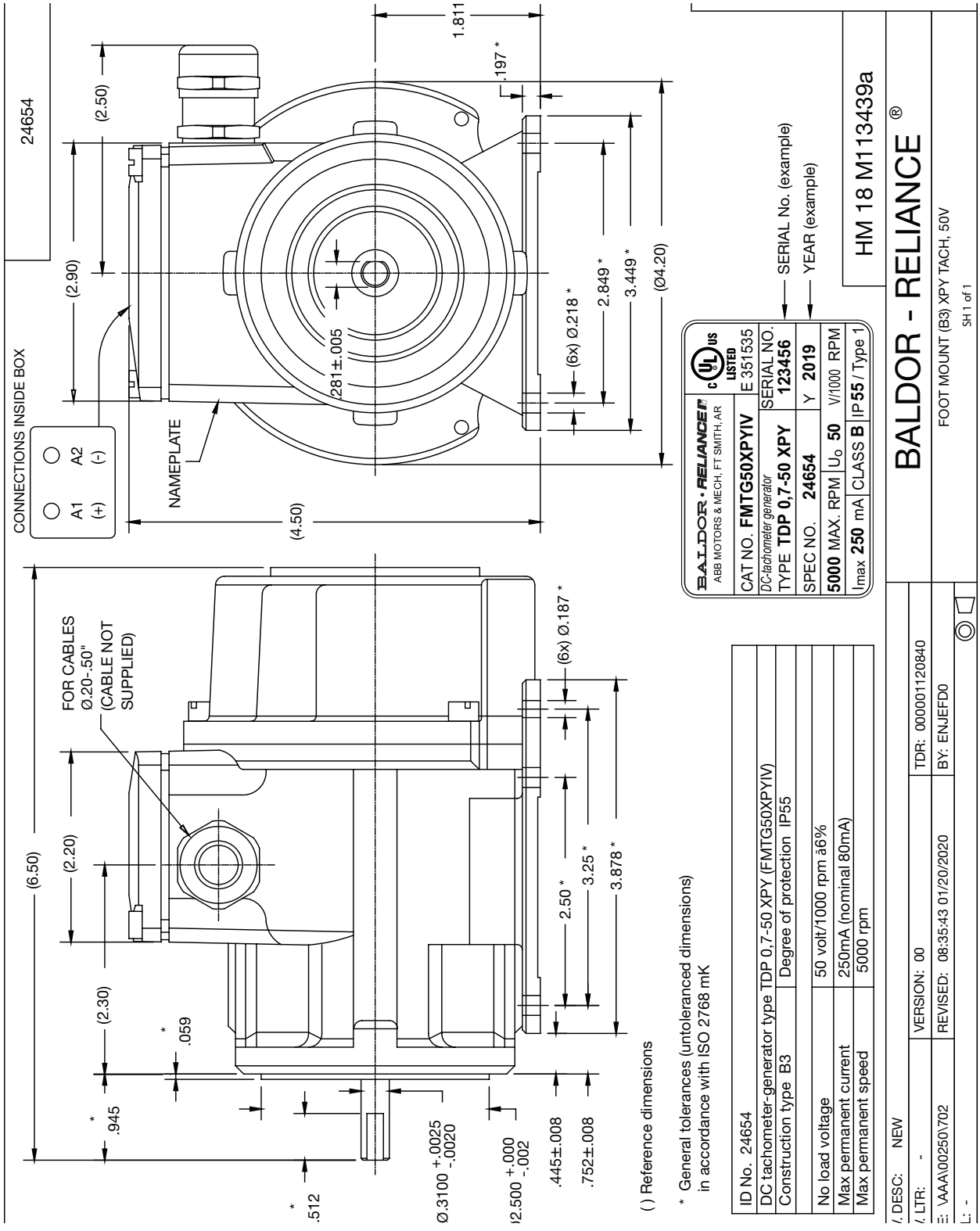
8.1.2 Foot Mount



8.1.3 Face Mount



8.1.4 Foot Mount



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