



POWER TAKE OFF RECOMMENDATIONS BEFORE START-UP



Manufacturer's Declaration

ABER ensures compliance of its products with the essential health and safety requirements of the Directive 2006/42/EC and harmonized standard EN ISO 12100:2010.

General information

The Power Take Offs (PTO's) are mechanical devices that transmit mechanical power. They are usually applied to gearboxes from where the power is taken to be transmitted to the hydraulic pumps, intermediate shafts, etc. Normally applied in dumpers, cranes, cleaning systems, moving floors, compressors, power generators, etc. This device stands out due to its low noise and its high efficiency.

How to use

The following procedure is not valid for automatic gearboxes. The procedure to operate the PTO should always be made with the vehicle parked, parking brake actuated, engine running and gear box in neutral.

1. press the clutch for 5/10 seconds;
2. turn on PTO control (pneumatic, vacuum, electric or mechanic);
3. release the clutch slowly.

To disconnect the PTO:

1. press the clutch for 5/10 seconds;
2. turn off PTO control;
3. release the clutch.

ATTENTION

PTO must be turned off, before the vehicle starts moving again. Do not exceed the limits of power and torque indicated in the technical sheet. The incorrect engagement and disengagement may cause premature equipment damage.

Maintenance

Daily	Monthly	Annually
-Check the tightness of the pneumatic system and the light switches.	-Check the tightness of the pneumatic system and the light switches. -Check the oil level and refill if necessary. We advise consulting the gearbox manufacturer recommendations. -Check the tightness of the fixation studs and if necessary tighten more. Consult torque table to tight studs correctly. -Visual inspection of all the components and if necessary proceed with the repair.	-Check the tightness of the pneumatic system and the light switches -Check the oil level and refill if necessary. We advise seeing the gearbox manufacturer recommendations. -Check the tightness of the fixation studs and if necessary tighten more. Consult torque table to tight studs correctly. -Visual inspection of all the components and if necessary proceed with the repair. -Clean the gearbox and if necessary proceed with the repair.

General information to mount a PTO

-The general instructions contained in this document do not replace specific information of any component involved in the assembly.

-To install the PTO, the vehicle must be parked on a flat surface with the engine off and parking brake applied.

-Use only the components supplied with the PTO.

-Before final tightening, we recommend that you tighten the lock-nuts to the minimum torque and operate the PTO for 10/15 seconds. This allows the gears in the gearbox to self-align and also to check for any excessive noise.

-Before re-filling the gear-box with oil it is advisable to check the noise level of the PTO. If the PTO produces a hissing noise, this means that there is insufficient backlash in which case another gasket must be added. If the Power Take-off rattles, this indicates that there is too much backlash and the number of gaskets must be reduced. Once the gearbox has been refilled with oil, make sure there are no leaks. Make sure that the power required from the unit is effectively obtainable from the gearbox. If the Power Take Off becomes noisy after the additional assembly of a universal joint, make sure that the joint is not damaged nor are the edges of the gearbox and PTO.

Torque Table

Size (mm - inch)	M8 5/16"	M10 3/8"	M12 1/2"
Screws and nuts Torque (Nm)	25	50	80
Studs Torque (Nm)	10	20	30

Installation of a side mount PTO

1 - Drain the oil from the gearbox, remove hatch cover and the respective gasket and verify if the PTO and gearbox gears are compatible;

2 - Clean the lip of the hatch with a wire brush or spatula, being careful not to let any foreign bodies into the gearbox;

3 - If the PTO uses studs, fit them on the gearbox. Consult torque table to tighten studs correctly. In the case of through-threading, make sure that the studs do not interfere with the gears inside the gearbox. Apply a sealing glue to the thread of the studs;

4 - Fit one or more gaskets as needed, between the inspection hatch and the PTO body. Ensure that between the teeth of the gears in the gearbox and those in the PTO there is a backlash of 0,15-0,3 mm.

ATTENTION

Do not use more than three gaskets.

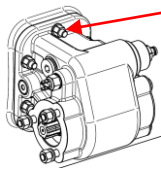
5 - Fit the PTO to the gearbox. On the PTO body there is a plug that, if unscrewed, is large enough to allow manual checking of backlash between the PTO and the gears of the gearbox. The upper wheel of the PTO should move manually and not be too loose, that is, not hitting anything.



This procedure should be checked with the engine off and the truck blocked with the parking brake.



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6 - Fit the PTO tightly onto the gearbox. Consult torque table to tighten studs correctly. This operation is more secure when using a dynamometric spanner. Check the oil quality and level recommended by the manufacturer of the vehicle and of the gearbox.

7 - Place fittings and accessories for control.

Installation of a rear mount PTO

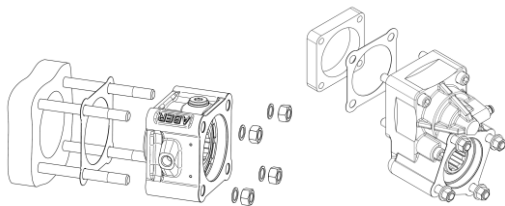
1-Drain the oil from the gearbox (in some gearboxes this step is not needed because the oil level does not reach the rear door), find the rear open and remove its cover and the respective gasket.

2-Clean the surface of the hatch with a wire brush or spatula, being careful not to let any foreign bodies in the gearbox;

3-If the PTO uses studs, fit them on the gearbox. Consult torque table to tighten studs correctly. In the case of through-threading, make sure that the studs do not interfere with the gears inside the gearbox. Apply a sealing glue to the thread of the studs;

4-Fit one gasket between the inspection hatch and the PTO's body.

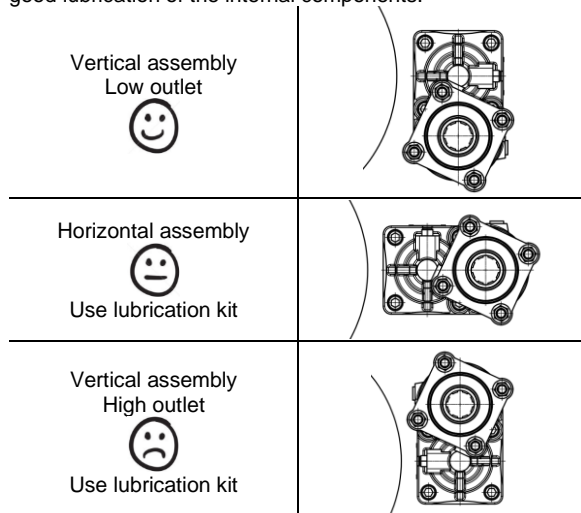
5- Install the PTO on the gearbox (install the pump in the PTO when studs are used to fix both components) and tighten the screws using the tightening torque indicated in the torque table.



6-Check the oil and the level given by the manufacturer of the vehicle and refill the oil of the gearbox taking into account the presence of the PTO.

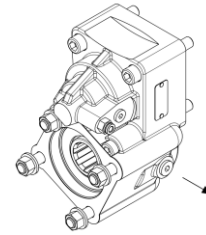
7-Place the fitting and the air pipe.

ATTENTION For multi axis PTO it is recommend that you assemble the PTO according to the positions indicated in the following diagram, which ensure a good lubrication of the internal components.

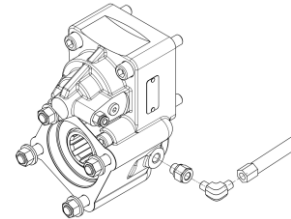


Lubrication kit

To assemble the lubrication kit, it is necessary to remove the plug located on the side of the PTO.



After removing the plug, you can assemble the (male female) adapter to the PTO and then the (male male) 90° adapter and the hose supplied by ABER. After this assembly to the PTO, it is necessary to connect the hose to the gearbox.



Faults, causes and remedies

Faults	Causes	Remedies
Noise	<ol style="list-style-type: none"> 1.Vehicles clutch is not working properly 2. Assembly clearance 3.Broken teeth 4.Damaged roller-bearings 	<ol style="list-style-type: none"> 1.Fully press the clutch or wait more time for the gearbox gearing to stop 2. Check/adjust the looseness between the teeth and the thickness of the gaskets 3-4.Repair or replace
Over-heating	<ol style="list-style-type: none"> 1-2.Lack of lubrication 3.Too tight between the wheel of the PTO and the wheel of the gearbox 	<ol style="list-style-type: none"> 1.Refill the oil level 2.Use a PTO with a lubrication hose connected directly to the gearbox 3.Adjust the gap between teeth with the thickness of the gaskets
Leaks	<ol style="list-style-type: none"> 1.Loose fixation nuts and studs 2.Damaged gasket 	<ol style="list-style-type: none"> 1.Tighten according to recommendations 2.Replace gasket for another with the same thickness
PTO doesn't engage	<ol style="list-style-type: none"> 1.Obstructed air hose 2.Low air pressure 3.Control failure 	<ol style="list-style-type: none"> 1.Clean or replace hose 2.Check for leak source and fix it 3.Repair or replace control
PTO doesn't disengage	<ol style="list-style-type: none"> 1. Internal PTO problem 	<ol style="list-style-type: none"> 1.Repair or replace control
No transmission of movement	<ol style="list-style-type: none"> 1.PTO blockage 	<ol style="list-style-type: none"> 1.Repair or replace control

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- ✓ A PTO should be mounted by qualified personnel. The correct mounting of the PTO is influenced by the ability of the operator;
- ✓ Always read carefully all owner's manuals, or other instructions before installation of PTO and driven equipment;
- ✓ In case of difficulties please ask our service department for advice;
- ✓ To install a PTO or perform maintenance, the vehicle must be parked on a flat surface with the engine off and parking brake applied;
- ✓ Use appropriated tools and safety equipment;
- ✓ Ensure that the system cannot boot involuntarily;
- ✓ Ensure that the levels and quality of the oil are as recommended, that there are no leaks and that everything is properly tightened before starting;
- ✓ When the PTO is working, never touch or pull hoses or intermediate shaft when applied. When intermediate shaft is applied take into account that parts can be ejected;
- ✓ The spline shaft (male or female) protruding from the PTO rotates with no protection when the pump has not been assembled. Avoid any contact between the shaft and any object and, more importantly, protect the working area to prevent contact with body parts or clothing;
- ✓ Install the pump or the cardan shaft only when the engine is off and the PTO has been disconnected;
- ✓ For the assembly of the cardan shaft, it is necessary to use all the precautions set out by the current regulation on safety in the workplace;
- ✓ The gearbox or the PTO may attain high very temperatures after prolonged use. It is therefore necessary to take all the necessary measure to prevent burns or wait for the mechanical parts to cool down to temperatures appropriate for skin contact;
- ✓ The application of the ABER's PTO must follow all the instructions hereby mentioned in order to assure the safety of all personal working with the equipment, including its surroundings, assure a long life to the product and preserve the warranty of the brand. All applications that do not follow the hereby instruction are solely the users responsibility. If there should happen any malfunctioning, it is strictly forbidden the disassembly of the product except if it is being made by a qualified technician of the brand or if there is a special authorization to do that. If this specification is not followed, warranty can be lost.

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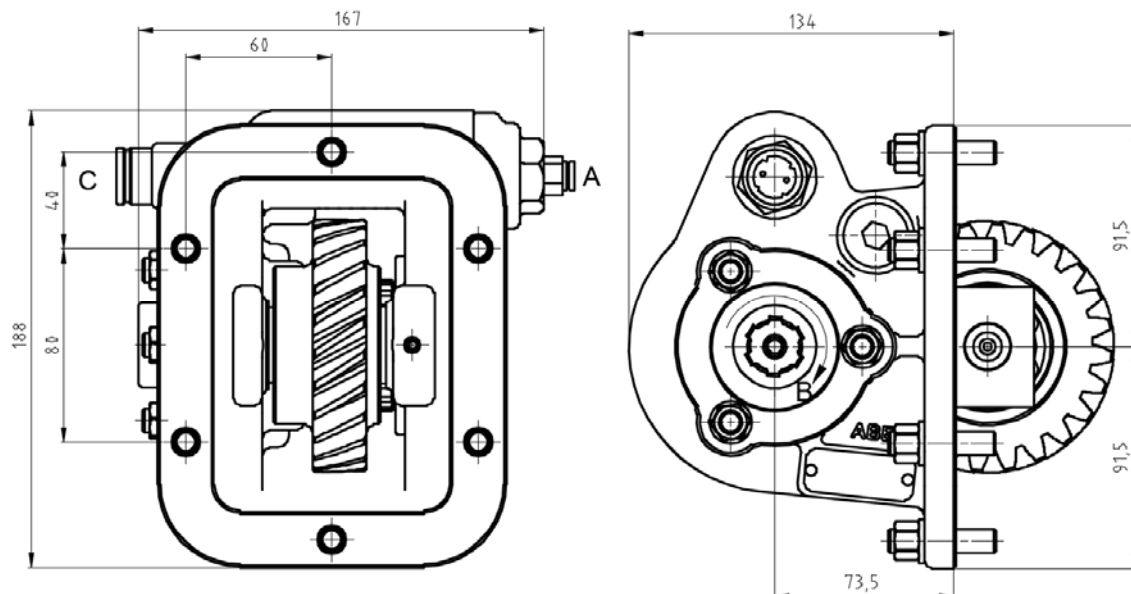
Power Take Offs

Ref. TF2011APUNI

MITSUBISHI

M060S6-OD-6.748 ; M060S6-6.875 ; Pneumatic Control

Main Dimensions



- A – Air connection
- B – Pump rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2011APUNIC

(Dimensions in mm)

Main Data

Continuous Torque (Nm)	280
Intermittent Torque (Nm)	350
Power (at 1000 rpm)	39 cv / 29 kW
Mounting Position	Left
Pump Rotation	Left Hand
Weight (approx.) (kg)	12
PTO internal ratio	1:1,37
Indicative ratio from motor to PTO's output	1:1,000

CTI TF2011APUNI 1610-00

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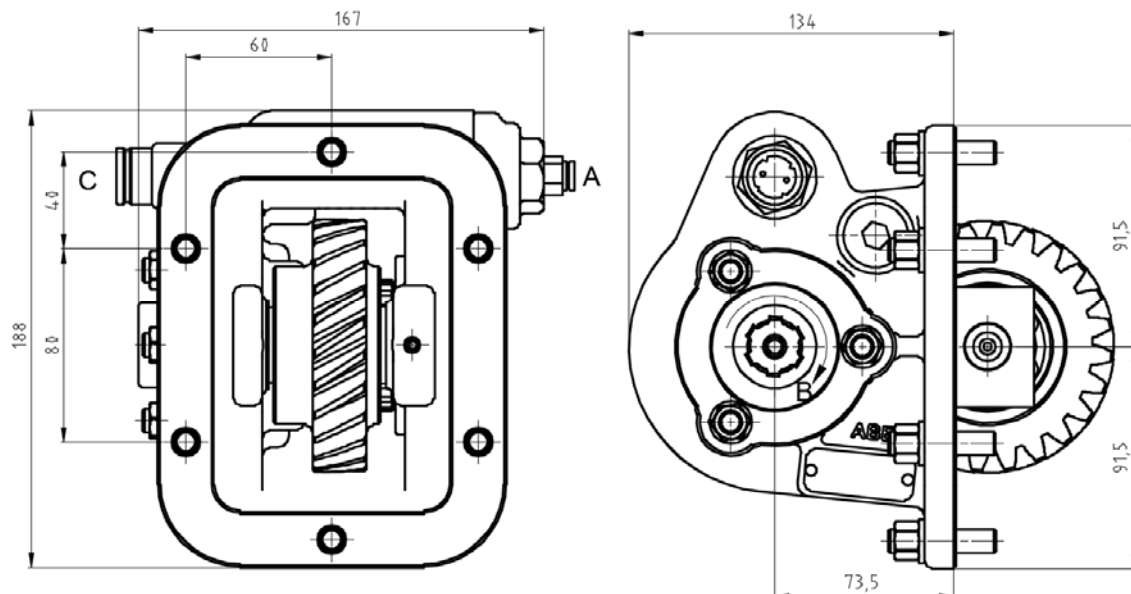
Power Take Offs

Ref. TF2012APUNI

MITSUBISHI

M060S6-D-8.064 ; M070S6-D-8.064 ; Pneumatic Control

Main Dimensions



- A – Air connection
- B – Pump rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2012APUNIC

(Dimensions in mm)

Main Data

Continuous Torque (Nm)	280
Intermittent Torque (Nm)	350
Power (at 1000 rpm)	39 cv / 29 kW
Mounting Position	Left
Pump Rotation	Left Hand
Weight (approx.) (kg)	12
PTO internal ratio	1:1,2
Indicative ratio from motor to PTO's output	1:1,059

CTI TF2012APUNI 1610-00

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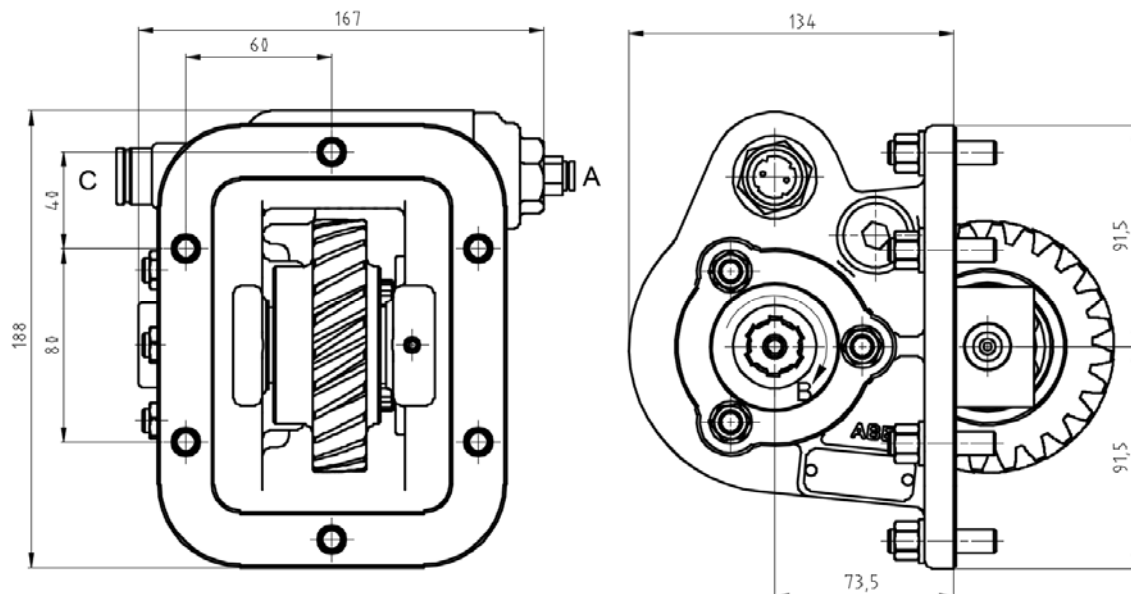
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Power Take Offs		Ref. TF2013APUNI
MITSUBISHI	M070S6-OD-6.807 ; Pneumatic Control	

Main Dimensions



- A – Air connection
- B – Pump rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2013APUNIC

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	280
Intermittent Torque (Nm)	350
Power (at 1000 rpm)	39 cv / 29 kW
Mounting Position	Left
Pump Rotation	Left Hand
Weight (approx.) (kg)	12
PTO internal ratio	1:1,65
Indicative ratio from motor to PTO's output	1:1,212

CTI TF2013APUNI 1610-00

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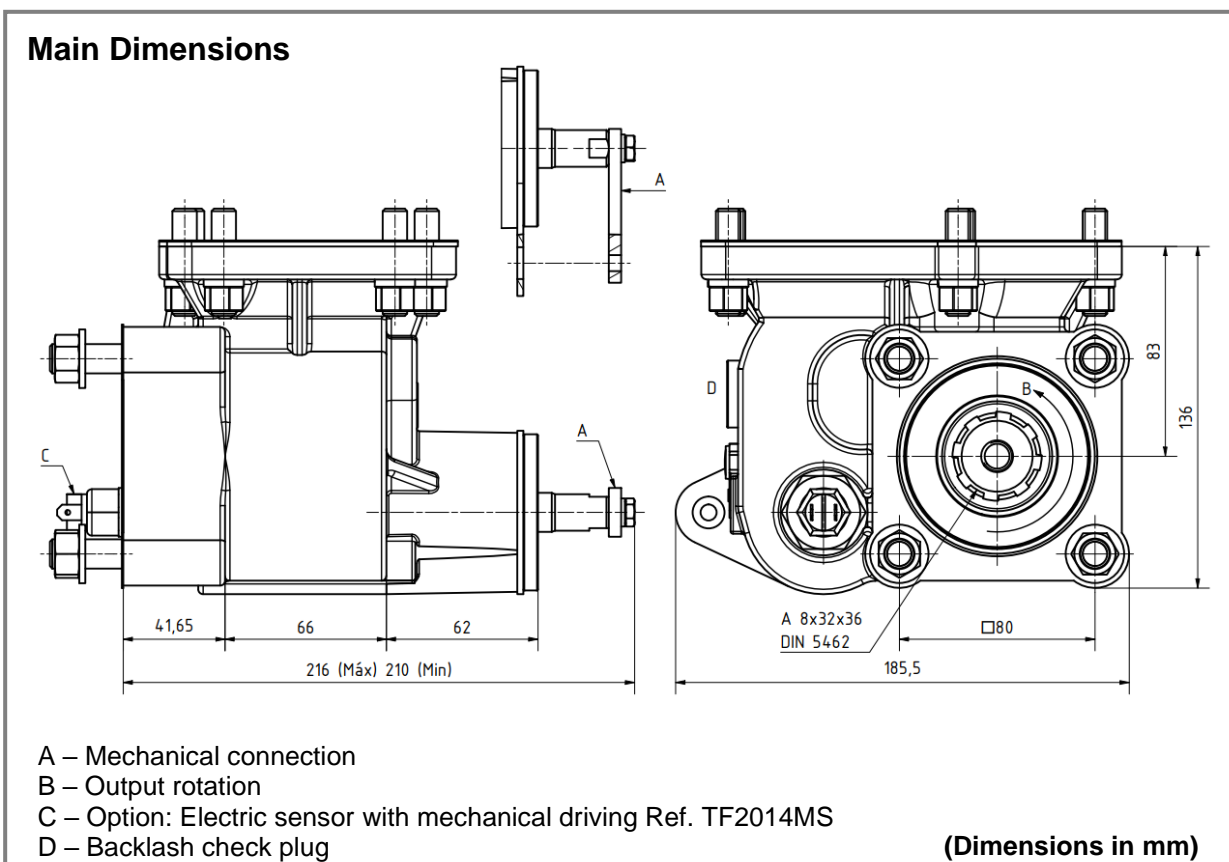


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Power Take Offs		Ref. TF2014M
CANTER	M2-S5; M3-S5 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:1
Indicative ratio from motor to PTO's output	1:0,522

CTI TF2014M 2012 - 1

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Power Take Offs		Ref. TF2014P
CANTER	M2-S5; M3-S5 Pneumatic Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Pneumatic connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2014PS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:1
Indicative ratio from motor to PTO's output	1:0,522

CTI TF2014P 2012 - 1

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Power Take Offs		Ref. TF2014V
CANTER	M2-S5; M3-S5 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Vacuum connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2014VS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:1
Indicative ratio from motor to PTO's output	1:0,522

CTI TF2014V 2012 - 1

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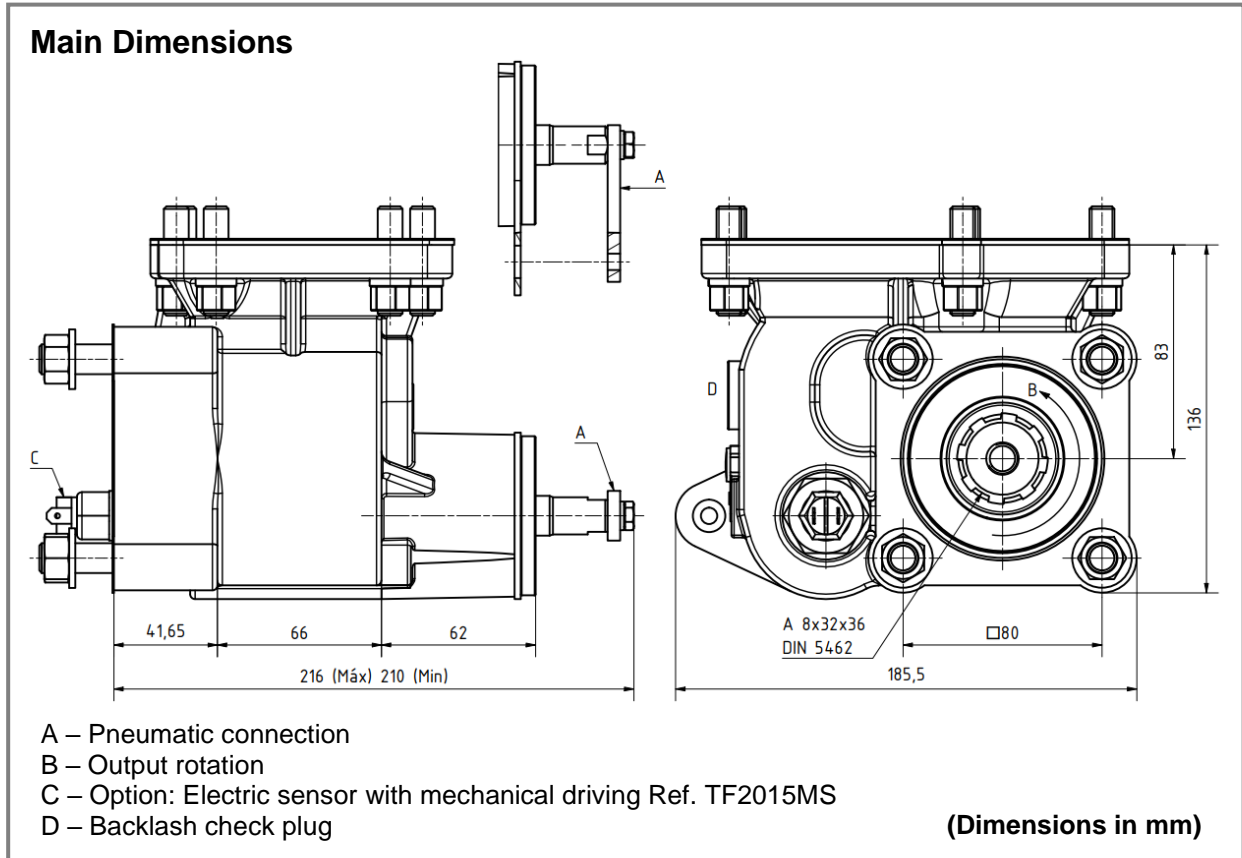
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Power Take Offs		Ref. TF2015M
CANTER	MO15S5 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,88
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2015M 2010-00

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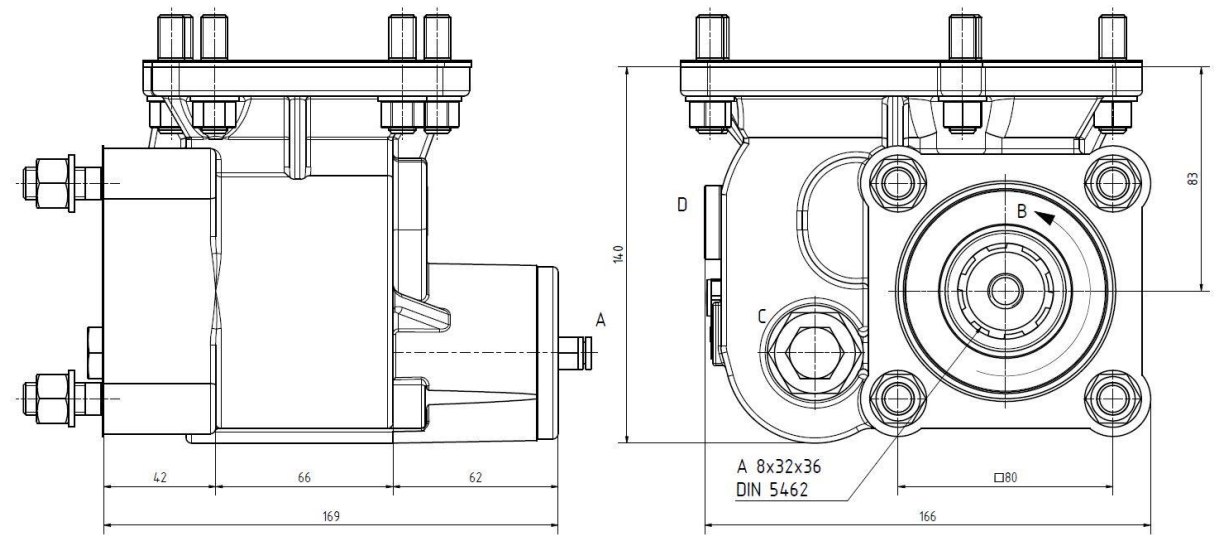
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Power Take Offs		Ref. TF2015P
CANTER	MO15S5 Pneumatic Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions



- A – Pneumatic connection
- B – Output rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2015PS
- D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,88
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2015P 1910-00

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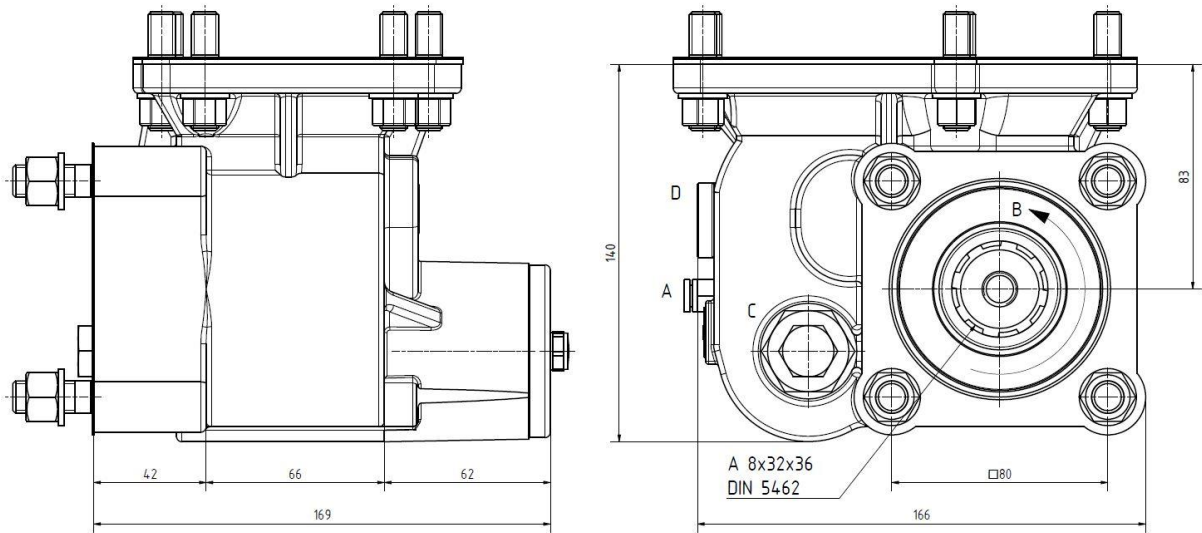
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Power Take Offs		Ref. TF2015V
CANTER	MO15S5 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions



- A – Vacuum connection
- B – Output rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2015VS
- D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,88
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2015V 1910-00

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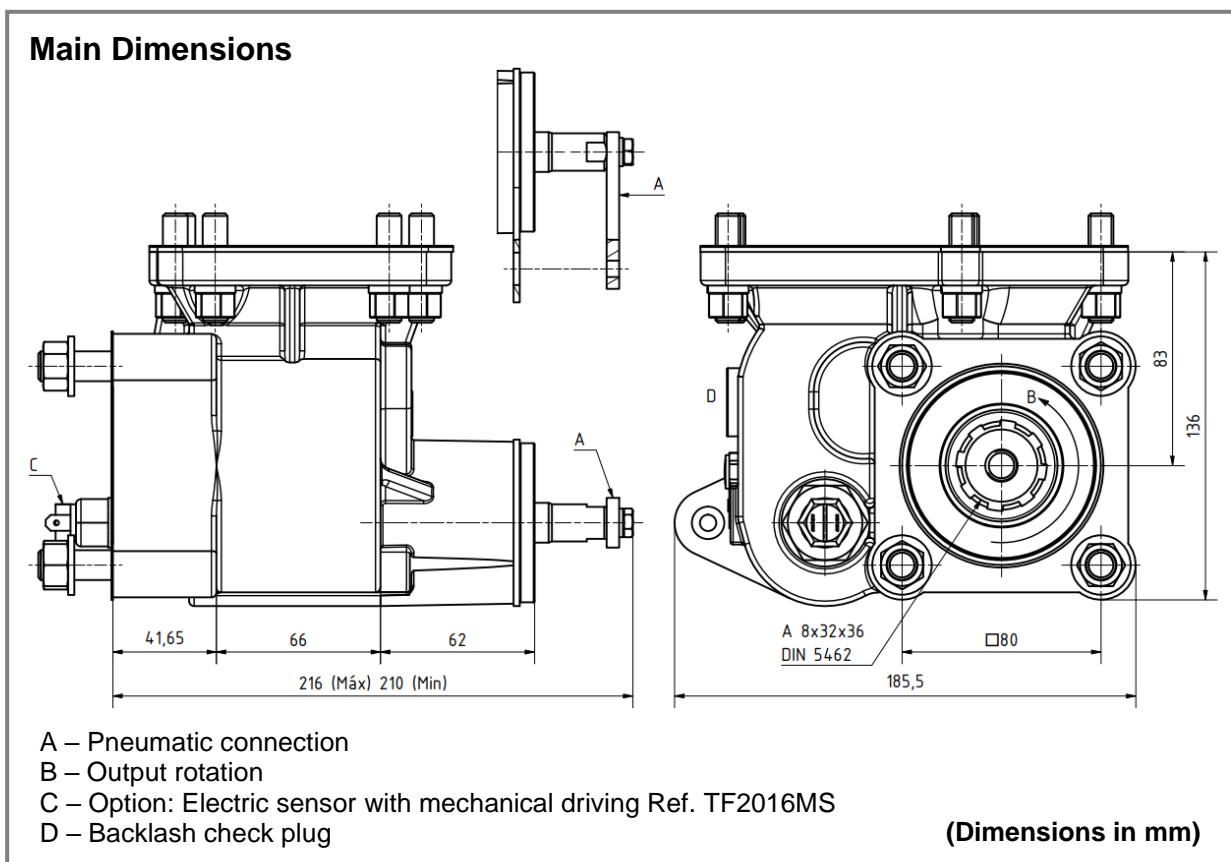


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Power Take Offs		Ref. TF2016M
CANTER	MO35S5; MO35S6 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2016M 2010-00

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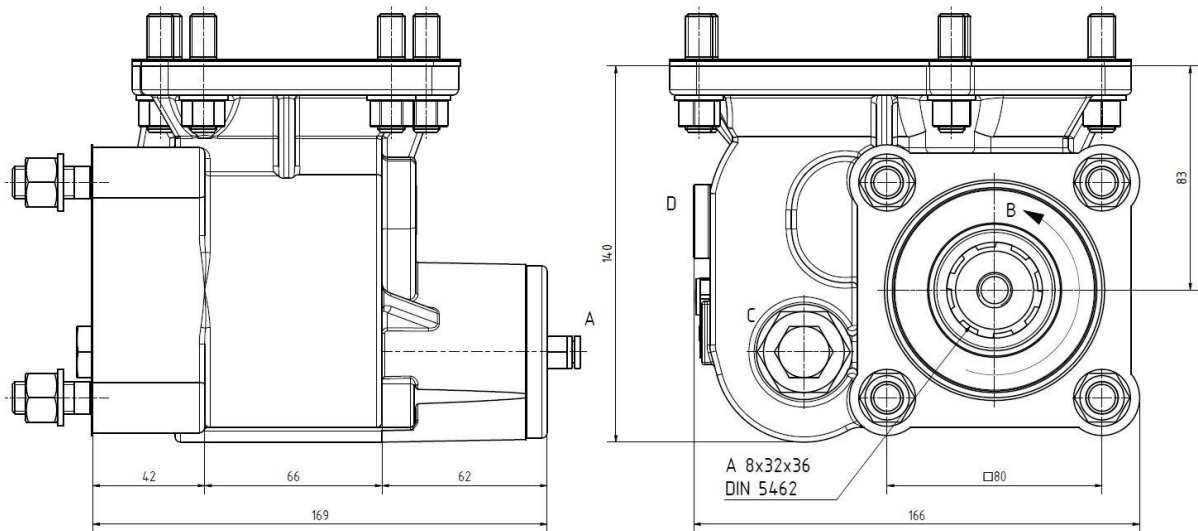
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Power Take Offs		Ref. TF2016P
CANTER	MO35S5; MO35S6 Pneumatic Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions



- A – Pneumatic connection
- B – Output rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2016PS
- D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
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Indicative ratio from motor to PTO's output	1:0,43

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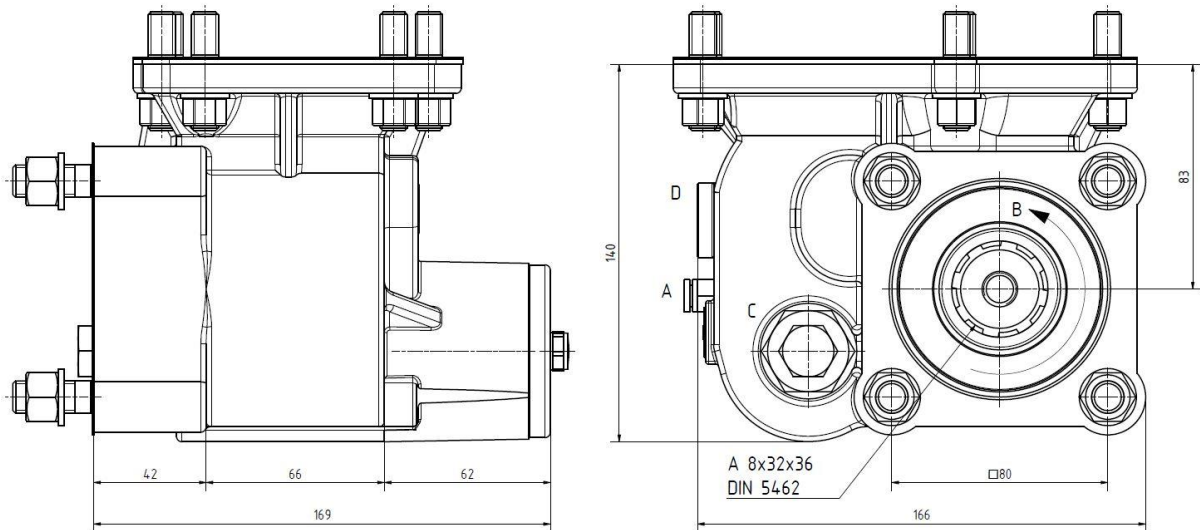
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Power Take Offs		Ref. TF2016V
CANTER	MO35S5 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions



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- B – Output rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2016VS
- D – Backlash check plug

(Dimensions in mm)

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CTI TF2016V 1910-00

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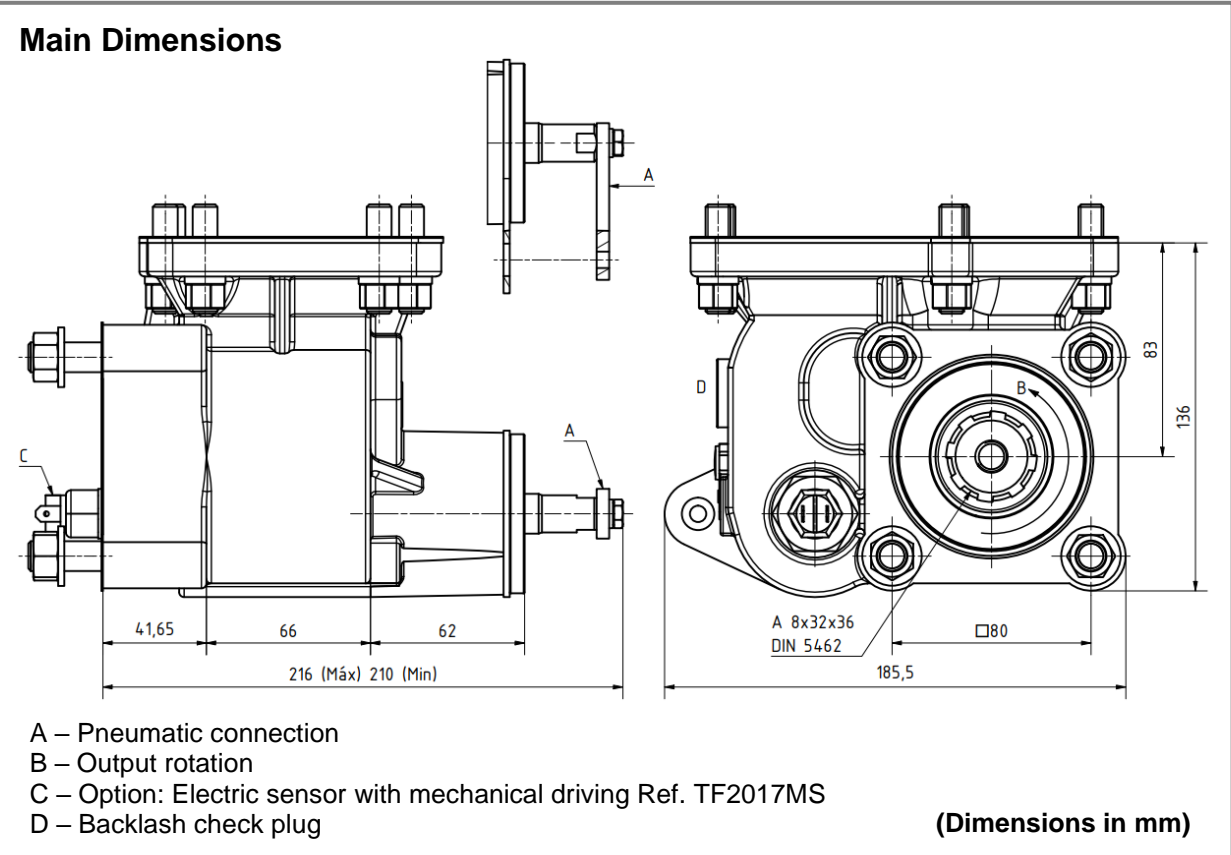


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Power Take Offs		Ref. TF2017M
CANTER	MO25S5 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2017M 2010-00

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Power Take Offs		Ref. TF2017P
CANTER	MO25S5 Pneumatic Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Pneumatic connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2017PS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2017P 1910-00

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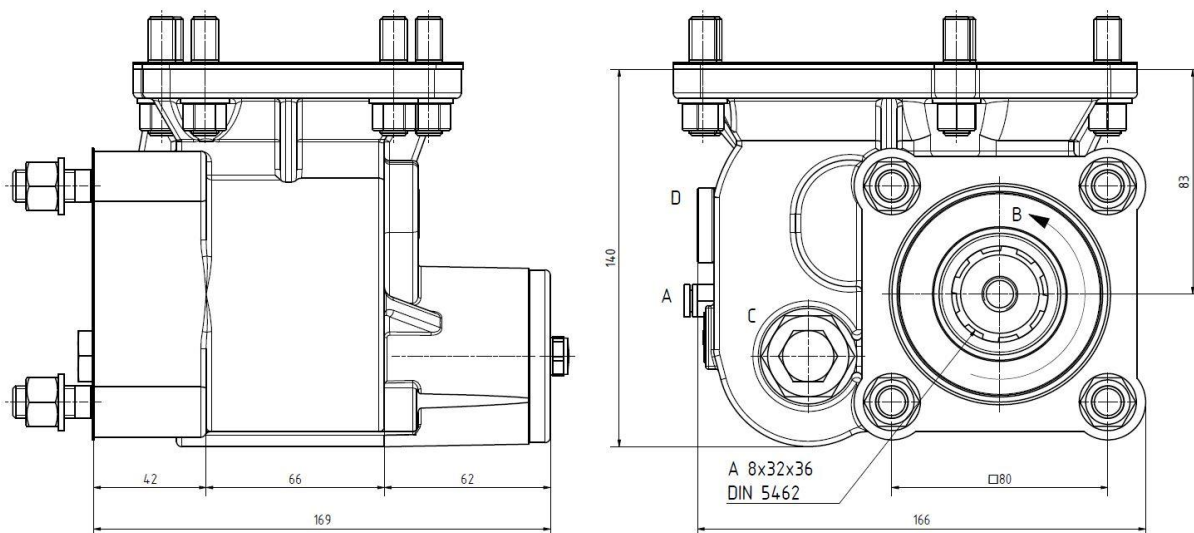
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Power Take Offs		Ref. TF2017V
CANTER	MO25S5 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions



- A – Vacuum connection
- B – Output rotation
- C – Option: Electric sensor with mechanical driving Ref. TF2017VS
- D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2017V 1910-00

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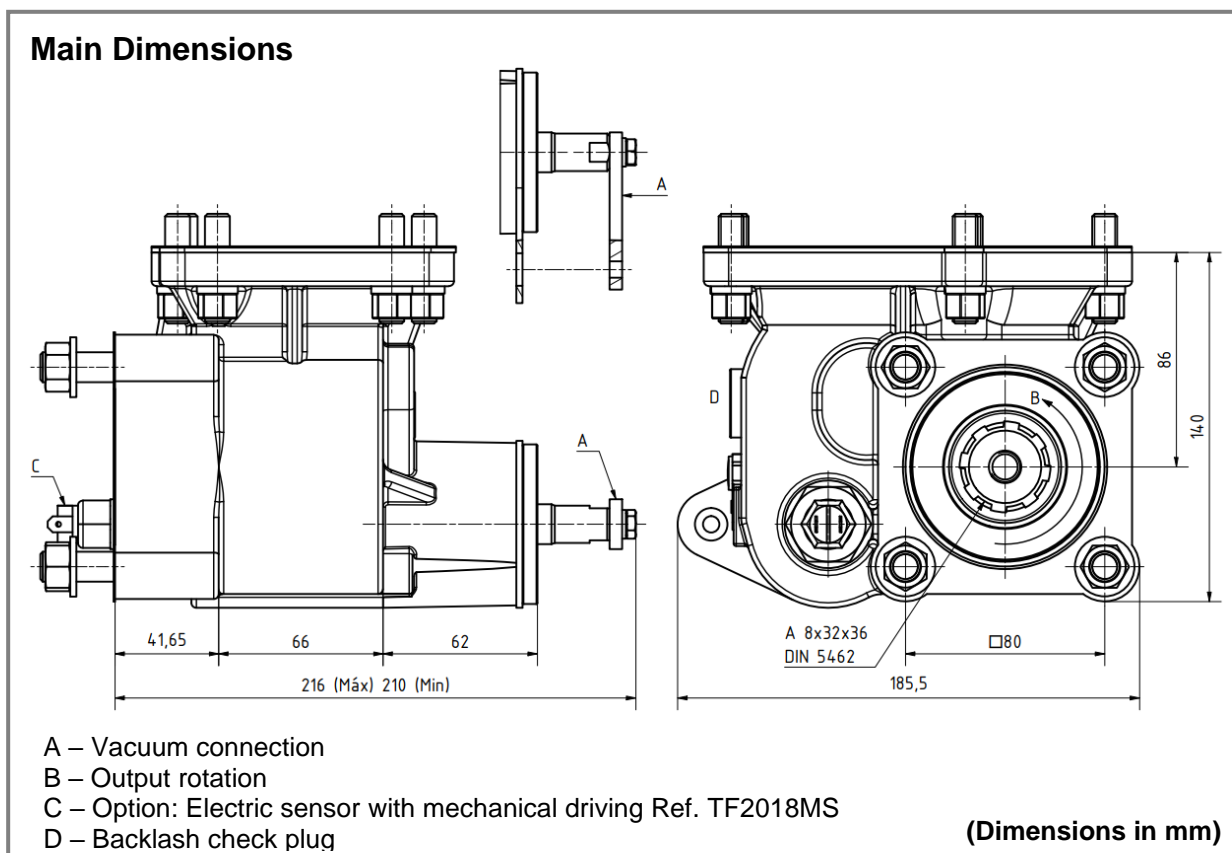


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Power Take Offs		Ref. TF2018M
CANTER	MO27S5; MO38S5; MO38S6 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Máx. Torque (Nm)	200
Power (at 1000 rpm)	28 cv / 21 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,90
Indicative ratio from motor to PTO's output	
MO27S5	1:0,475
MO38S5; MO38S6 MT	1:0,418
MO38S5; MO38S6 AMT	1:0,426

CTI TF2018M 2010-00

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Power Take Offs		Ref. TF2018V
CANTER	MO27S5; MO38S5; MO38S6 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Vacuum connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2018VS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Máx. Torque (Nm)	200
Power (at 1000 rpm)	28 cv / 21 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,90
Indicative ratio from motor to PTO's output	
MO27S5	1:0,475
MO38S5; MO38S6 MT	1:0,418
MO38S5; MO38S6 AMT	1:0,426

CTI TF2018V 1907-00

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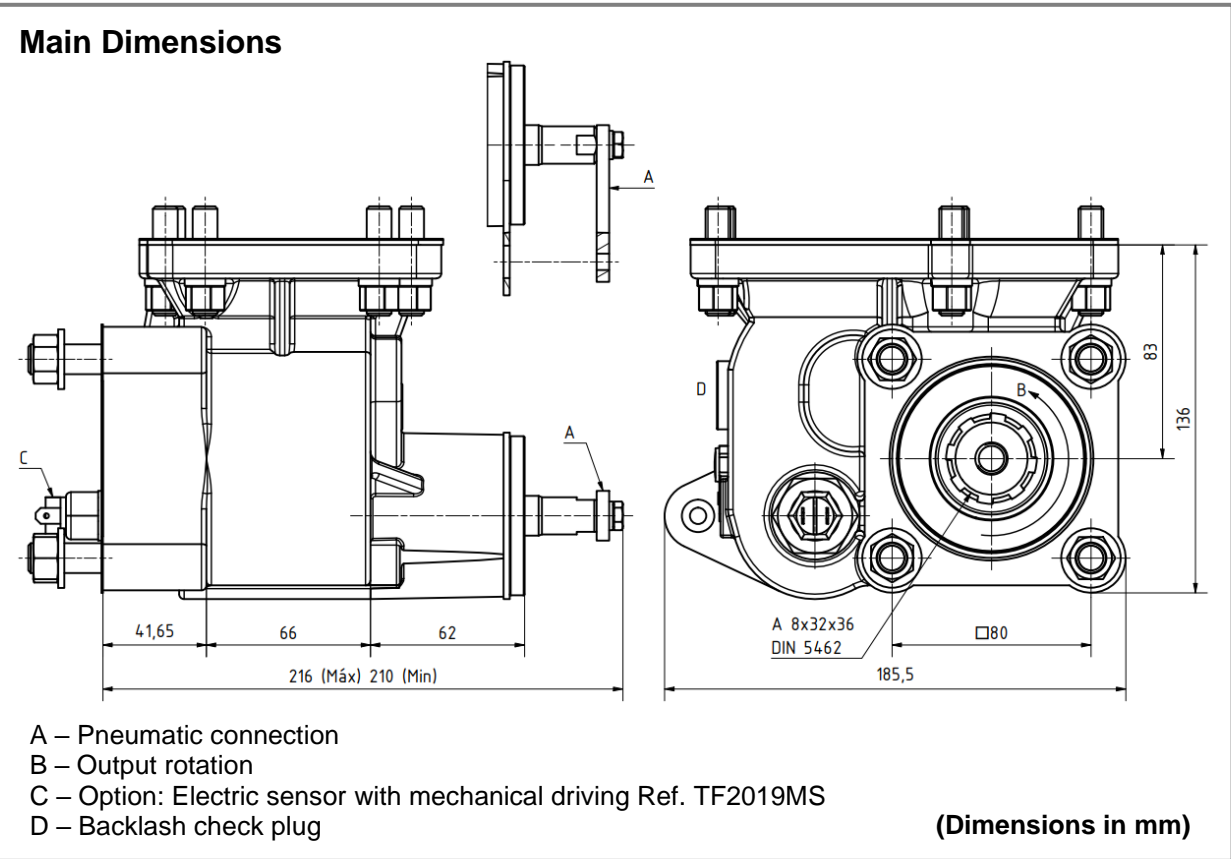


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Power Take Offs		Ref. TF2019M
CANTER	MO36S5; MO36S6 Mechanical Control	

To apply with Gear Pumps or Piston Pumps



Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2019M 2010-00

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Power Take Offs		Ref. TF2019P
CANTER	MO36S5; MO36S6 Pneumatic Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Pneumatic connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2019PS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2019P-1910-00

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Power Take Offs		Ref. TF2019V
CANTER	MO36S5; MO36S6 Vacuum Single Effect Control	

To apply with Gear Pumps or Piston Pumps

Main Dimensions

A – Vacuum connection
 B – Output rotation
 C – Option: Electric sensor with mechanical driving Ref. TF2019VS
 D – Backlash check plug

(Dimensions in mm)

Main Data	
Continuous Torque (Nm)	150
Intermittent Torque (Nm)	210
Power (at 1000 rpm)	21 cv / 16 kW
Mounting Position	Left
Pump Rotation	Right Hand
Weight (kg)	5
PTO internal ratio	1:0,91
Indicative ratio from motor to PTO's output	1:0,43

CTI TF2019V 1910-00

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