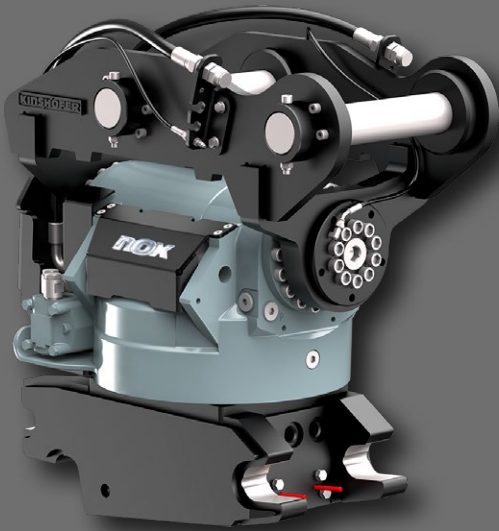


TILTROTATORS



TILTROTATORS - WHY

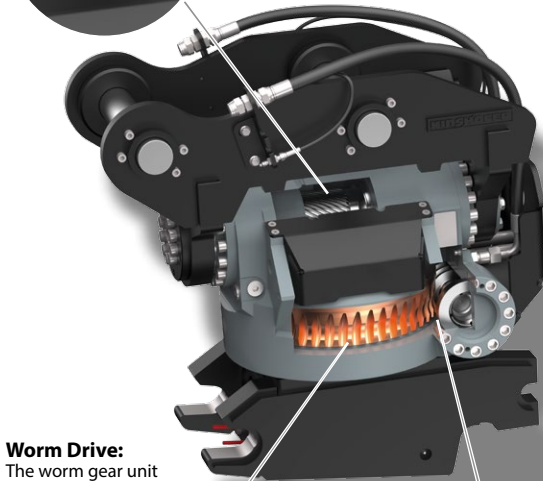
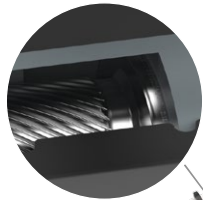
- Reduced Manpower on the work site
- Less machines needed
- More Work – more efficient
- Time Savings on a work site up to 30 %
- Fuel Savings – ecological
- Increased Safety on the work site

NOX TILTROTATORS

Experience and innovation have led to one of the most advanced tools for excavators – the **NOX** Tiltrotator: continuous 360° rotation and a tilting angle of up to 2 x 55° make it a universal joint. Combined with quick change system and various attachments this means highest efficiency at any construction site. The **NOX** Tiltrotator range is optimally engineered to suit excavators with an operating weight from 3t / 6600 lbs to 25t / 55000 lbs.

Elliptic Rotary Actuator:

A very low designed drive unit, featuring no hydraulic cylinders, ensures an extremely compact design. The tilting angle has been constructed larger to provide more flexibility.



Worm Drive:

The worm gear unit runs in its own lubricant. Low maintenance.



Cast Body:

High strength of the body is achieved by a special alloy cast material. This guarantees a long life even in toughest applications.



noX - MAIN BENEFITS



NO CYLINDERS

- Narrow width -> not much wider than excavator boom end
- Compact design -> structural height is low
- No protruding, disturbing parts such as cylinders
- Enables deep trenches, work under & between existing pipes & cables



LARGE TILTING ANGLE

- Up to 2 x 55° (TR10NOX)
- More flexibility to excavate with different attachments
- Less movement of the excavator on site



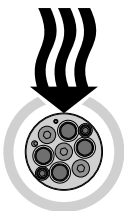
SERVICE FRIENDLY DESIGN

- Only 2 greasing points
- Easy installation -> saves time and money
- Less wear parts -> low life cycle costs
- Integrated hydraulics where all valves are well protected
- Reliable industrial valves



PATENTED TILTING FUNCTION

- No cylinders
- Constant tilting force with constant speed
- Closed system – less damage risks



HIGH FLOW SWIVEL

– always 2 extra functions available

- High flow swivel -> up to 150 l/min – 40 gpm
- Good tolerance against backpressure
- Electrical swivel possible
 - Integrated sensors for 2D/3D excavating systems
- 2 extra functions always available, also with high-flow swivel
- 300 bar/4350 psi output to extra functions



CONTROLLING SYSTEMS

- All required controlling systems available: DF08/DF10, DF04, CSP
- Proportional control for all functions
- Easy installation and user interface
- Can control other tiltrotators
- Suitable for all excavators on the market

TILTROTATOR - SWIVEL



Maximize your productivity with integrated tilt rotator support

ELECTRICAL SWIVEL

The NOX can be optionally equipped with electrical swivel. This enables the use of 2D/3D excavating systems and also the use of different extra safety requiring quick coupler systems. NOX can be equipped with integrated sensors for different excavating systems. Also there will be one sensor for tilt position and one sensor for rotation position. Possibility to integrate sensors into NOX housing. Available for NOX sizes: TR14, TR19, TR25

HIGH FLOW SWIVEL

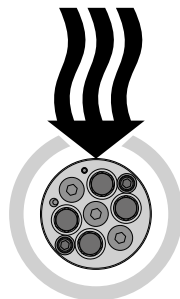
The NOX can be equipped with the high flow swivel. This means that it is possible to run oilflow up to 150 l/min / 40 GPM through the NOX unit for an attachment tool and with up to 300 bar / 4350 psi pressure. This enables the use of wide range of attachment tools that require high oil flow and high pressure.

Always 2 extra functions available:

- 1 for integrated gripper
- 1 for other extra working tool

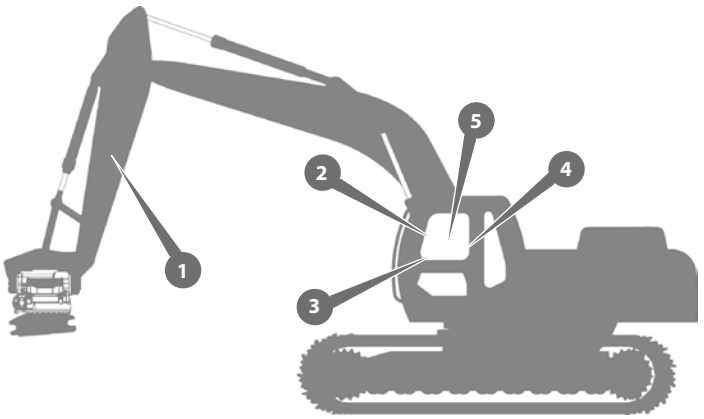
Two versions available:

- Standard version swivel:
 - 70 l/min - 18.5 gpm and 40 l/min - 10.5 gpm oilflows
- High flow swivel:
 - TR14/19: 70 / 120 l/min - 18.5 / 32 gpm and
 - TR25: 70/150 l/min - 18.5 / 40 gpm
- High pressure can be driven through both swivel:
 - up to 300 bar / 4350 psi



High-flow version for DF4 controlling system available 2017

TILTROTATOR - CSP CONTROL SYSTEM



1 Boom cable: (1)



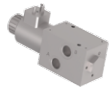
2 Display: (2)
Highbrightness display
Readable in direct sunlight
Easy change between different profiles
Locking / unlocking of quick coupler



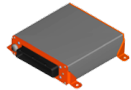
3 Joysticks: (3)
SVAB L8 as standard
Others on request



4 Feeder Valve: (4)
Control the hammer valve
Installed on the pilot pressure line



5 NOX-Control Unit: (5)
Optimised for NOX
Can control other tiltrotators
10 user profiles



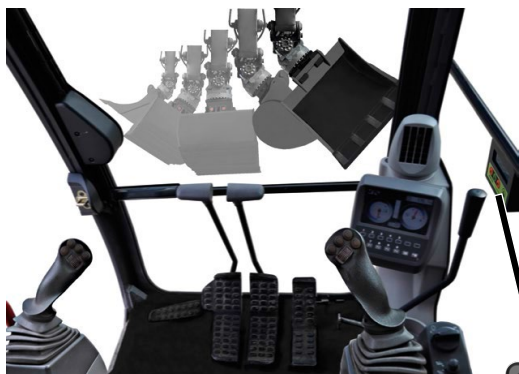
Configurable with Laptop:
Configuration software
Easy user interface
Fast and easy to set up different profiles



2 Extra Functions:
Proportionally controlled

Optional
Driving Function:
Wheel or track control

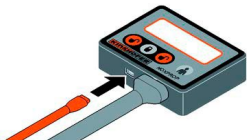
TILTROTATOR - CSP CONTROL SYSTEM



Machine requirements:

- Minimum of one single acting hydraulic circuit (hammer line with free return line to tank)
- Control System specially designed for NOX Tiltrotator
- All functions can be controlled proportionally
- All parameters can be adjusted individually (important for controllability of NOX and different attachment tools)
- Up to 10 different user/attachment profiles (more flexibility)
- Easy and fast installation (easy to set up parameters)
- Optional driving functions of the excavator can be controlled

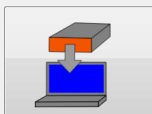
NOXPROP USER INTERFACE



Configure a
new NOX

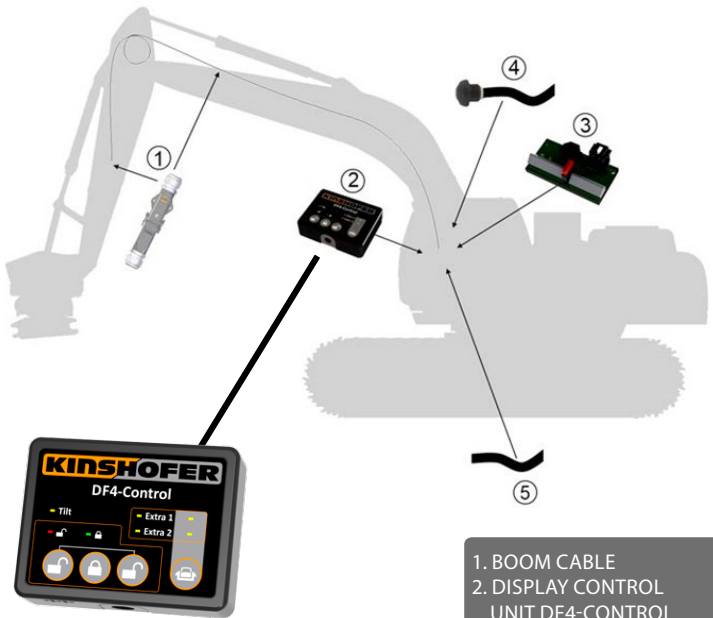


Open a
Configuration File



Load Configuration
from Control Unit

TILTROTATOR - DF4 CONTROL

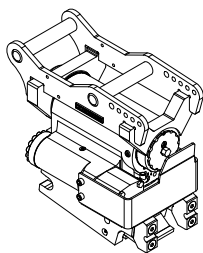
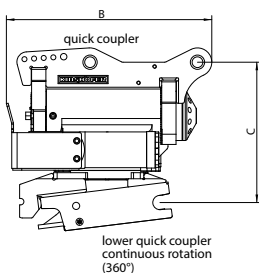
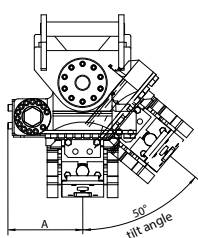


1. BOOM CABLE
2. DISPLAY CONTROL UNIT DF4-CONTROL
3. DISTRIBUTION MODULE
4. JOYSTICK CABLE WITH BUTTON
5. CONNECTION CABLE FOR POWER SUPPLY

Machine requirements:

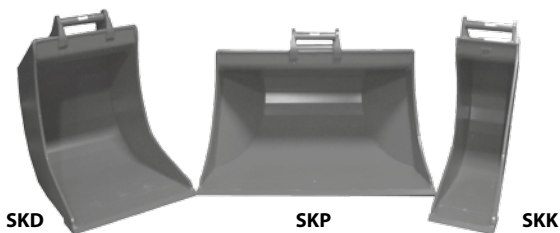
- 2 double acting hydraulic circuits needed on the machine
 - 1st hydraulic circuit controls the rotation
 - 2nd hydraulic circuit controls tilt-, extra-function and quick coupler
 - Change between different functions is realized with integrated change valves on the NOX
- One free ON/OFF button on the existing joysticks is also needed for controlling the change between different functions
- No need to rebuild the original joysticks
- Quick coupler switch will be installed to the excavator cabin

TR06NOX



total height depends on the mounted upper bracket and lower quick coupler

TR06NOX - BUCKET SET



Bucket Set incl. SKP 6 / SKD 6 / SKK 6

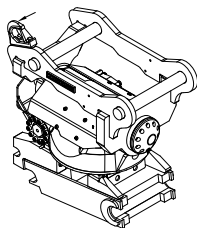
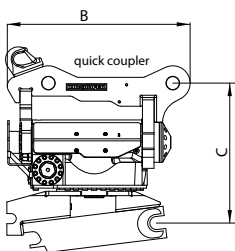
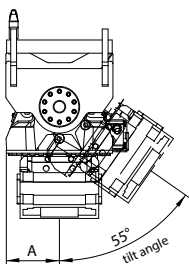
Type	Self weight (approx. kg/lbs)	Width (mm/in)	Volume (litre/c.y.)
SKP 6 Grading Bucket	130 / 286	1300 / 51.18	300 / 0.39
SKD 6 General Purpose Bucket	150 / 330	720 / 28.35	280 / 0.37
SKK 6 Trench Bucket	75 / 158	300 / 11.81	160 / 0.21

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Tiltrotator Type		TR06NOX	
	unit	DF10	DF4
Machine size	t/lbs	3 - 6 / 6600 - 13200	
Breaking force max. (ISO)	kN/lbf	35 / 7700	
Bucket width max.	mm/in	1300 / 51.2	
Weight (from) ¹⁾	kg/lbs	120 / 264	
Width A ¹⁾	mm/in	187 / 7.4	
Length B ¹⁾	mm/in	500 / 19.7	
Height C ¹⁾	mm/in	370 / 14.6	
Tilt angle	°	2 x 50	
Tilt torque	Nm/ft.lbs	8500 / 6269	
Rotation speed	1/min	9 at 40 l/min / 10.6 GPM	
Rotation torque	Nm/ft.lbs	4500 / 3319 constant at 360° continuous	
Oil flow extra function 1/2 max.	l/min / GPM	35 / 9.3	
Hydraulic pressure max.	bar/psi	rotation: 200 / 2880 tilt: 250 / 3600	rotation: 200 / 2880 tilt: 250 / 3600
Recommended pressure in return line	bar/psi	10 / 144	
Number of swivel channels extra function	number	4	2
Number of swivel channels quick coupler	number	2	

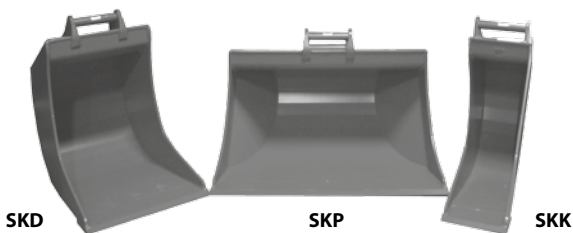
¹⁾ reference: TR06NOX S40/S40

TR10NOX



total height depends on the mounted upper bracket and lower quick coupler

TR10NOX - BUCKET SET



Bucket Set incl. SKP 12 / SKD 10 / SKK 12

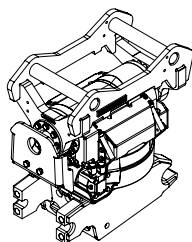
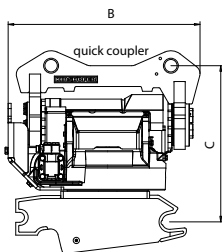
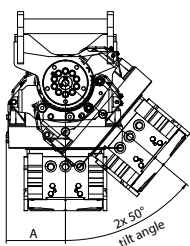
Type	Self weight (approx. kg/lbs)	Width (mm/in)	Volume (litre/c.y.)
SKP 12 Grading Bucket	210 / 462	1500 / 59.06	500 / 0.65
SKD 10 General Purpose Bucket	210 / 462	800 / 31.50	450 / 0.59
SKK 12 Trench Bucket	120 / 264	400 / 15.75	275 / 0.36

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Tiltrotator Type		TR10NOX			
	unit	DF10	DF8	DF4	CSP
Machine size	t/lbs	5 - 10 / 11000 - 22000			
Breaking force max. (ISO)	kN/lbf	70 / 15400			
Bucket width max.	mm/in	1600 / 63			
Weight (from) ¹⁾	kg/lbs	220 / 484			
Width A ¹⁾	mm/in	205 / 8.1			
Length B ¹⁾	mm/in	610 / 24			
Height C ¹⁾	mm/in	445 / 17.5			
Tilt angle	°	2 x 55			
Tilt torque	Nm/ft.lbs	10500 / 7744			
Rotation speed	1/min	7.5 at 40 l/min / 10.6 GPM			
Rotation torque	Nm/ft.lbs	6500 / 4794 constant at 360° continuous			
Oil flow extra function 1/2 max.	l/min / GPM	40/70 / 10.6/18.5	70 / 18.5	40 / 10.6	40 / 10.6
Hydraulic pressure max.	bar/psi	rotation: 200 / 2880 tilt: 250 / 3600	rotation: 200 / 2880 tilt: 250 / 3600	rotation: 200 / 2880 tilt: 250 / 3600	250 / 3600
Recommended pressure in return line	bar/psi	10 / 144			
Number of swivel channels extra function	number	4	2	2	2
Number of swivel channels quick coupler	number	2			

¹⁾ reference: TR10NOX S45/S45

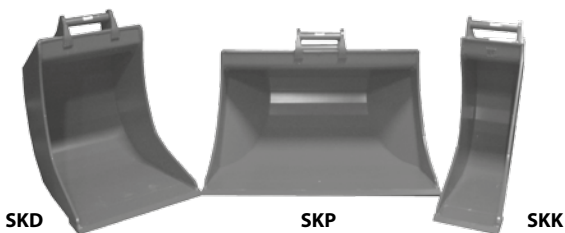
TR14NOX



lower quick coupler
continuous rotation
(360°)

total height depends on
the mounted upper bracket
and lower quick coupler

TR14NOX - BUCKET SET



Bucket Set incl. SKP 16 / SKD 14 / SKK 14

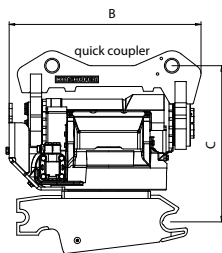
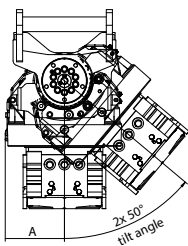
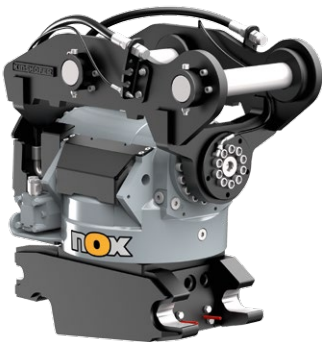
Type	Self weight (approx. kg/lbs)	Width (mm/in)	Volume (litre/c.y.)
SKP 16 Grading Bucket	500 / 1100	1600 / 63	600 / 0.78
SKD 14 General Purpose Bucket	255 / 561	800 / 31.5	500 / 0.65
SKK 14 Trench Bucket	140 / 308	500 / 19.7	300 / 0.39

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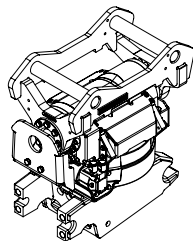
Tiltrotator Type		TR14NOX	DF10	DF4	CSP
Machine size	unit				
Breaking force max. (ISO)	t/lbs		10 - 14 / 22000 - 30800		
Bucket width max.	kN/lbf		110 / 24200		
Weight (from) ¹⁾	mm/in		1600 / 63		
Width A ¹⁾	kg/lbs		440 / 968		
Length B ¹⁾	mm/in		225 / 8.9		
Height C ¹⁾	mm/in		610 / 24		
Tilt angle	mm/in		550 / 21.7		
Tilt torque	°		2 x 50		
Rotation speed	Nm/ft.lbs		26000 / 19175		
Rotation torque	1/min		8,5 at 45 l/min / 11.9 GPM		
Oil flow extra function 1/2 max.	Nm/ft.lbs		6000 / 4425 constant at 360° continuous		
Hydraulic pressure max.	l/min / GPM		SD ²⁾ : 70/40 / 18.5/10.6 HF ³⁾ : 70/120 / 18.5/31.7	SD ²⁾ : 70/40 / 18.5/10.6 HF ³⁾ : 70/120 / 18.5/31.7	
Recommended pressure in return line	bar/psi		rotation: 200 / 2880 tilt: 300 / 4320	rotation: 200 / 2880 tilt: 300 / 4320	tilt: 300 / 4320
Number of swivel channels extra function	bar/psi			25 / 360	
Number of swivel channels quick coupler	number			4	
Number of channels separate drain line	number			2	
Electric swivel (optional)	number			1	
	channels x A				12 x 0,5

¹⁾ reference: TR14NOX S45/S45 ²⁾ SD = Standard-swivel ³⁾ HF = High-Flow-swivel

TR19NOX



lower quick coupler
continuous rotation
(360°)



total height depends on
the mounted upper bracket
and lower quick coupler

TR19NOX - BUCKET SET

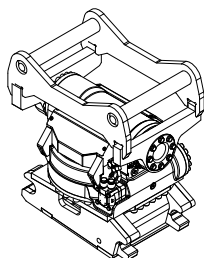
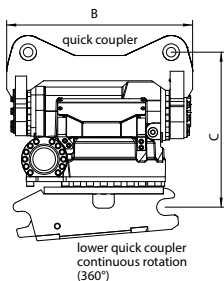
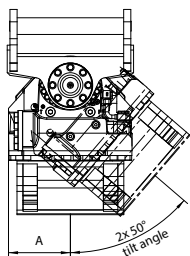


Bucket Set incl. SKP 18 / SKD 18 / SKK 22

Type	Self weight (approx. kg/lbs)	Width (mm/in)	Volume (litre/c.y.)
SKP 18 Grading Bucket	380 / 836	1700 / 66.93	750 / 0.98
SKD 18 General Purpose Bucket	400 / 880	900 / 35.43	650 / 0.85
SKK 22 Trench Bucket	270 / 594	400 / 15.75	340 / 0.44

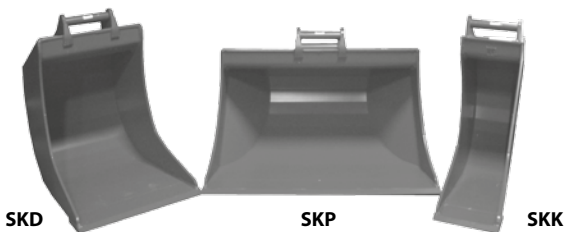
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TR25NOX



total height depends on the mounted upper bracket and lower quick coupler

TR25NOX - BUCKET SET



Bucket Set including SKP 24 / SKD 22 / SKK 22

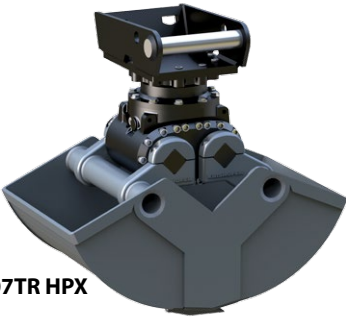
Type	Self weight (approx. kg/lbs)	Width (mm/in)	Volume (litre/c.y.)
SKP 24 Grading Bucket	600 / 1322	1800 / 70.86	1200 / 1.57
SKD 22 General Purpose Bucket	850 / 1874	1000 / 39.36	1095 / 1.43
SKK 22 Trench Bucket	310 / 684	500 / 19.68	375 / 0.49

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Tiltrotator Type		TR25NOX	
	unit	DF10	DF4
Machine size	t/lbs	18 - 25 / 39600 - 55000	
Breaking force max. (ISO)	kN/lbf	170 / 37400	
Bucket width max.	mm/in	2000 / 78.7	
Weight (from) ¹⁾	kg/lbs	780 / 1716	
Width A ¹⁾	mm/in	260 / 10.2	
Length B ¹⁾	mm/in	760 / 29.9	
Height C ¹⁾	mm/in	650 / 25.6	
Tilt angle	°	2 x 50	
Tilt torque	Nm/ft.lbs	44000 / 32450	
Rotation speed	1/min	8,5 at 60 l/min / 15.9 GPM	
Rotation torque	Nm/ft.lbs	8000 / 5900 constant at 360° continuous	
Oil flow extra function 1/2 max.	l/min / GPM	SD ²⁾ : 70/40 / 18.5/10.6 HF ³⁾ : 70/150 / 18.5/39.6	SD ²⁾ : 70/40 / 18.5/10.6 HF ³⁾ : 70/150 / 18.5/39.6
Hydraulic pressure max.	bar/psi	rotation: 200 / 2880 tilt: 300 / 4320	rotation: 200 / 2880 tilt: 300 / 4320
Recommended pressure in return line	bar/psi	25 / 360	
Number of swivel channels extra function	number	4	
Number of swivel channels quick coupler	number	2	
Number of channels separate drain line	number	1	
Electric swivel (optional)	channels x A	12 x 0,5	

¹⁾ reference: TR25NOX S70/S70 ²⁾ SD = Standard-swivel ³⁾ HF = High-Flow-swivel

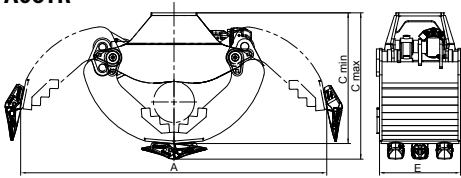
NOX - GRAPPLES



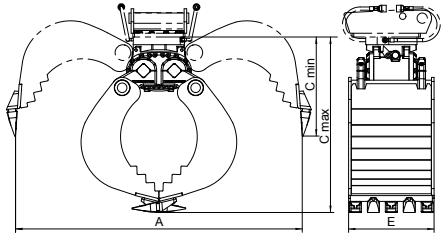
C07TR HPX



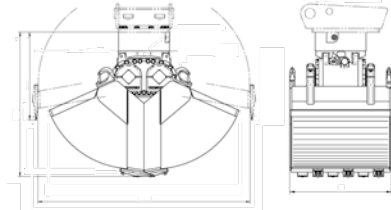
A06TR



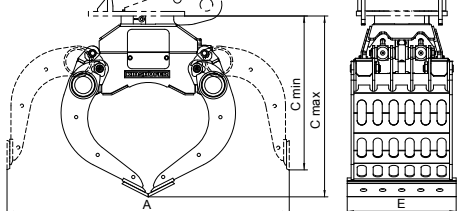
A11TR HPX



C11TR HPX



D18TR



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C-Series Clamshell Buckets / A-Series Multi Purpose Grabs / D-Series Selector Grabs

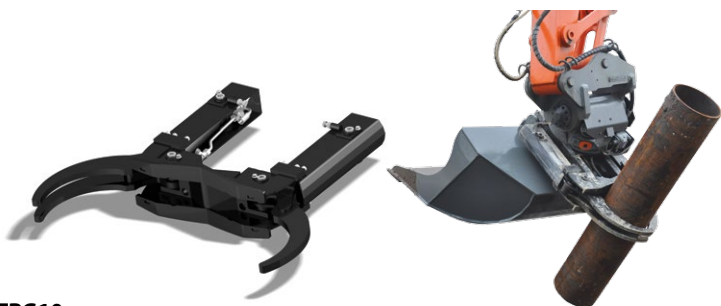
Type	Width E (mm/in)	Opening (w/o teeth) A (mm/in)	Volume (liter/cy.)	Height C max. (mm/in)	Height C min. (mm/in)	Weight* (kg/lbs)	Load capacity (kg/lbs)	Closing force** (kN/lbf)	Excavator operating weight (t/lbs)
C07TR-40 HPX	400 / 15.7	1170 / 46.1	115 / 0.15	670 / 26.4	395 / 15.6	295 / 649	3000 / 6600	22 / 4840	3-7 / 6600-15400
C07TR-50 HPX	500 / 19.7	1170 / 46.1	140 / 0.18	670 / 26.4	395 / 15.6	310 / 682	3000 / 6600	22 / 4840	3-7 / 6600-15400
C07TR-60 HPX	600 / 23.6	1170 / 46.1	170 / 0.22	670 / 26.4	395 / 15.6	325 / 715	3000 / 6600	22 / 4840	3-7 / 6600-15400
C11TR-40 HPX	400 / 15.7	1310 / 51.6	145 / 0.19	730 / 28.7	410 / 16.1	265 / 583	3000 / 6600	22 / 4840	5-11 / 11000-24200
C11TR-60 HPX	600 / 23.6	1310 / 51.6	220 / 0.29	730 / 28.7	410 / 16.1	315 / 693	3000 / 6600	22 / 4840	5-11 / 11000-24200
A06TR	400 / 15.7	1480 / 58.3	70 / 0.09	695 / 27.4	630 / 24.8	190 / 418	2000 / 4400	21 / 4620	3-6 / 6600-13200
A07TR HPX	400 / 15.7	1530 / 60.2	100 / 0.13	900 / 35.4	560 / 22.0	285 / 627	1000 / 2200	19 / 4180	3-7 / 6600-15400
A11TR HPX	500 / 19.7	1650 / 65.0	200 / 0.26	1030 / 40.6	580 / 22.8	355 / 781	2500 / 5500	14 / 3080	5-11 / 11000-24200
A18TR	600 / 23.6	1870 / 73.6	260 / 0.34	1220 / 48.0	1120 / 44.1	480 / 1056	3000 / 6600	30 / 6600	9-18 / 19800-39600
D07TR HPX	400 / 15.7	950 / 37.4	60 / 0.08	620 / 24.4	355 / 14.0	253 / 557	1000 / 2200	26 / 5720	3-7 / 6600-15400
D11TR-50 HPX	500 / 19.7	1400 / 55.1	125 / 0.16	840 / 33.1	410 / 16.1	306 / 673	1000 / 2200	18 / 3960	5-11 / 11000-24200
D11TR-60 HPX	600 / 23.6	1400 / 55.1	200 / 0.26	840 / 33.1	410 / 16.1	355 / 781	1000 / 2200	18 / 3960	5-11 / 11000-24200
D18TR-60	600 / 23.6	1555 / 61.2	225 / 0.29	1000 / 39.4	850 / 33.5	390 / 858	3000 / 6600	36 / 7920	9-18 / 19800-39600
D18TR-84	840 / 33.1	1890 / 74.4	380 / 0.50	1195 / 47.0	1000 / 39.4	730 / 1606	5000 / 11000	42 / 9240	18-25 / 39600-55000

* weight w/o quick change adapter and hydraulic hoses ** at 26 MPa (260 bar) / 3744 psi

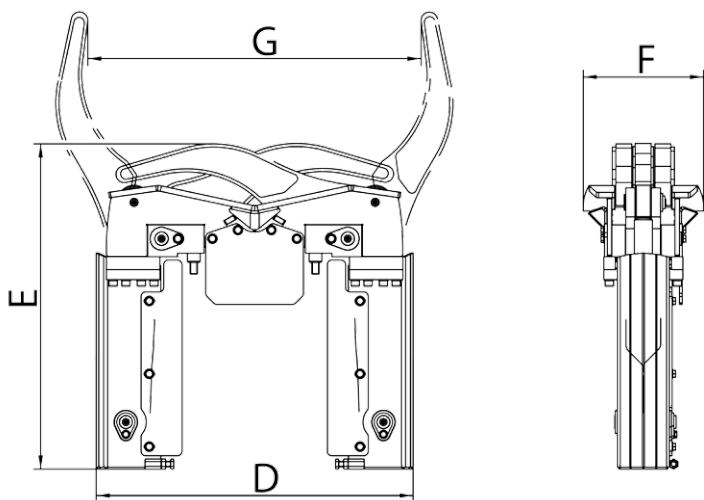
Requirements of Excavator

Operating pressure:	C07TR HPX / A07TR HPX D07TR / HPX	A06TR	C11TR HPX / A11TR HPX D11TR HPX	A18TR D18TR
	250 bar (max. 320 bar) / 3600 psi (max. 4608 psi)	max. 240 bar / 3456 psi	300 bar (max. 320 bar) / 4320 psi (max. 4608 psi)	300 bar / 320 bar / 4320 psi / 4608 psi
Pump capacity:	40 - 120 l/min / 10.6 - 31.7 GPM	25 - 75 l/min / 6.6 - 19.8 GPM	25 - 60 l/min / 6.6 - 15.9 GPM	50 - 100 l/min / 13.2 - 26.4 GPM

NOX - GRIPPERS



TRG10



We reserve the right to amend specifications without prior notice. **KINSHOFER** GmbH, 83666 Waakirchen, Germany

Gripper

Type	for NOX	Self weight (kg/lbs)	Dimensions D x E x F ¹⁾ (mm/in)	Opening width G (mm/in)	Closing time ²⁾ (sec.)	Closing force (kN/lbf)	Load capacity (kg/lbs)
TRG06	TR06NOX	40 / 88	470 x 515 x 140 / 10.5 x 20.3 x 5.5	415 / 16.34	1.5	7.5 / 1650	300 / 660
TRG10	TR10NOX TR14NOX	80 / 176	600 x 675 x 205 / 23.6 x 26.6 x 8.1	610 / 24.02	1.3	10 / 2200	500 / 1100
TRG18	TR14NOX TR19NOX TR25NOX	113 / 249	700 x 715 x 265 / 27.6 x 28.2 x 10.4	713 / 28.07	1.7	18 / 3960	900 / 1980
TRG25	TR25NOX	195 / 429	895 x 760 x 295 / 35.2 x 29.9 x 11.6	1100 / 43.31	2.0	19.5 / 4290	1400 / 3080

¹⁾ see technical drawing

²⁾ at 25 l/min / 6.61 GPM

Description: hydraulic gripper module, rigidly mounted to the **NOX**, can be used to pose masts, tubes etc. without the necessity of changing an attachment

NOX - IN ACTION





MORE THAN JUST 3 DIMENSIONS



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