SANDVIK CH870
CONE CRUSHER

TECHNICAL SPECIFICATION

Sandvik CH870 is a technologically advanced, high-capacity cone crusher designed for your mine's specific requirements. Each crusher has a hydraulically supported main shaft which is supported at both ends. With a robust design, adjustable eccentric throw, a constant intake opening, high performance can be achieved by proper selection of Sandvik OEM crushing chambers.

When used in secondary crushing applications, the Sandvik CH870 delivers high capacity thanks to its 520kW motor delivering higher power and more crushing force at maximum throw. The aggressive crushing action processes more ore, yet maintains product size, giving customers more throughput.

The Sandvik CH870 is also suitable for high reduction tertiary/pebble applications. The increased crushing force facilitates higher size reduction, resulting in a finer product size and less circulating load in closed circuits.

Each crusher is supplied as a complete package with all functions working in harmony and with a motor designed for exacting requirements. The Automatic Setting Regulation - ASRi™ control system enables real-time performance management, most tangibly equaling maximized crusher performance and productivity.

KEY FEATURES

Hydroset™ system	Provides safety and setting adjustment functions
ASRi™ coupled with Hydroset™	Automatically adapts the crusher to varying feed conditions ensuring maximum 24/7 performance
Mainframe is built as a unibody without moving parts	For optimal strength and less components requiring maintenance
Top serviceability	Lifting from above minimizes risks, and allows for quicker and safer maintenance
Adjustable eccentric throw	To exactly balance capacity to the process thus harmonizing the crushing stages
Constant liner profile	Maintains the feed opening and performance during the entire service life of the liners
Wide range of crushing chambers suited for all types of applications	Choose from extra coarse crushing chambers with the largest intake to extremely fine crushing chambers
PLC controlled electric dump valve for tramp iron protection	Reduces pressure peaks and mechanical stress on the crusher, greatly improving reliability
Tank instrumentation monitoring system (TIMS)	Offers real-time monitoring of the crusher lubrication system

GENERAL INFORMATION

GENERAL DESIGN CRITERIA

	CH870
Crusher type	Cone crusher, hydraulically adjusted
Application	Minerals processing
Crushing stage	Secondary, tertiary, quartenary, pebble
Max. feed size	300 mm
CSS range	10-70 mm
Nominal capacity*	179-1,473 mtph
Ambient temperature	-20°C to +40°C (Contact Sandvik if outside range)
Altitude of site	≤ 2000 m (Contact Sandvik if outside range)

* Capacity is dependent on the crushing chamber, the eccentric throw, the crusher's setting and the feed material's bulk density, crushability, size analysis, moisture content, etc.

GENERAL CRUSHER DATA

	CH870
Weight	49,800 kg
Main frame	Two-part unibody structure without moving parts. Cast steel.
Top shell	Two-arm design
Bottom shell	Four-arm design One inspection hatch
Feed hopper	Rubber lined steel hopper. Two inspection doors. Capacity 10,800 kg (bulk density 1,600 kg/m^3)
Feed level sensor	Vegapuls 67
Main shaft	Supported at both ends Top spider bearing and bottom eccentric bearing
Eccentric bushings (Throws – mm)	• 32, 37, 42, 47 • 47, 52, 57, 62 • 62, 68, 74, 80
Eccentric speed	280 rpm
Max. motor power	520 kW
Drive	Direct
Safety coupling	Safeset
Pinion shaft speed	880 rpm (50 Hz) 990 rpm (60 Hz)
Subframe	With rubber dampers
Maintenance tool box	Extractor for eccentric bushing. Extractor for bottom shell bushing. Extractor for step bearing Additional lifting and maintenance tools included

CRUSHING CHAMBERS

	CH870
Mantle alternatives	A, B, EF, OB, HR, FF
Concave alternatives	EC, C, MC, M, MF, F, EF
Alloys for mantles and concaves	M1, M2, M7
Mantle and concave backing material	Epoxy
Lifting tools for mantles and concaves	Available as option

CRUSHER DRIVE SYSTEM

MOTOR CHARACTERISTICS

Manufacturer	WEG
Model	HGF 450
Type	Three-phase, squirrel cage
Weight	5,600 kg depending on spec
Rated power	600 kW (ASRi limits it to 520 kW)
Frequency	50/60 Hz
Poles	6
Vibration resistance	Motor is supplied with special winding that is reinforced in order to support the vibration levels
Insulation class	F
Protection class	IP65

CRUSHER DUST EXCLUSION

SYSTEM CHARACTERISTICS

Type	Over-pressure air system
Air input	Blower (standard) or air regulator (option)
Air quality	Filtered
Air flow	20 m^3/h
Air pressure	Approx. 1 kPa
Weight (blower, hoses)	25 kg
Motor power	0.75 kW
Motor speed	2,800 rpm (50Hz) 3,350 rpm (60Hz)
Phases	3
Insulation class	F
Protection class	IP55

CRUSHER TRAMP IRON PROTECTION

HYDRAULIC PRESSURE RELIEF VALVE	
System description	Mechanical spring loaded hydraulic valve

ELECTRIC DUMP VALVE (OPTION)	
System description	Electrically controlled hydraulic valve
Pressure transmitter and an electric pilot valve connected to a dedicated, rapid sampling PLC system	
Hydraulic pressure sampling rate	200 times per second

Mechanical assembly	
Weight	212 kg
Dimensions (LxWxH)	320x407x643 mm
Heating elements	2 x 200 W

PLC cabinet	
Manufacturer	Siemens
Dimensions (LxHxD)	760x760x300 mm
Weight	83 kg
Supply voltage	100-240 VAC
Phases	1
Frequency	50/60 Hz
Power	750 W
Protection class	IP66
Control voltage	24 VDC
Communication interface	Hard-wired communication
Customer feedback signals	Electrical dump valve, ready Electrical dump valve, open Hydroset oil pressure, error Valve assembly temperature, error Electric pilot valve, error

CRUSHER WEAR PROTECTION

SPLITTER	
No. of wear components	16
Max. weight	25 kg
Material	Metal
Fastening method	Bolted

UPPER FEED HOPPER	
No. of rubber liners	16
Max. weight	15 kg
Material	Sandvik WT6000 rubber
Fastening method	Bolted

LOWER FEED HOPPER	
No. of rubber liners	12
Max. weight	33 kg
Material	Sandvik WT6000 rubber
Fastening method	Bolted

TOP SHELL SPIDER CAP	
Max. weight	559 kg
Material	Manganese steel
Fastening method	Bolts, seal with O-ring

TOP SHELL ARM SHIELDS	
No. of shields	2
Max. weight	162 kg
Material	Manganese steel
Fastening method	Welding

BOTTOM SHELL BODY LINERS	
No. of liners	16
Max. weight	54 kg
Material	Wear-resistant hardened steel
Fastening method	Welding

BOTTOM SHELL ARM LINERS	
No. of liners	4
Max. weight	165 kg
Material	Manganese steel
Fastening method	Welding

AUTOMATIC SETTING REGULATION - INTELLIGENT (ASRi™)

ASRi is the cone crusher's setting and regulation system.

MONITORING FUNCTIONS

Power draw (kW or hp)
Hydroset hydraulic pressure (MPa or psi)
Main shaft position
Calculated CSS (based on main shaft position)
Lubrication oil temperature
Liner wear
Historical data log

REGULATION FUNCTIONS (CRUSHING PROGRAMS)

Auto-load	The ASRi aims to maintain the maximum or desired load. The crusher adapts the settings in real time to match feed curve variations and/or variations in feed material hardness
Auto-CSS	The ASRi aims to maintain the desired CSS
20 customized programs can be stored	

SAFETY FUNCTIONS

Protects the crusher from overload by automatically regulating the crusher based on preset operational values
Remote push button setting calibration (metal-to-metal)
Alarm severity levels: A, B or C
Alarm log

OTHER FUNCTIONS

Automatic liner wear compensation
Push button setting calibration (metal-to-metal)

OPERATOR'S PANEL

	Wall mounted	Panel mounted (option)
Dimensions (LxHxD)	358x290x70 mm	350x290x88 mm
Weight	6.5 kg	5.6 kg
Operational temperature	-20°C to +50°C	-20°C to +50°C
Protection class	IP65 (front)	IP65 (front) IP30 (rear)
Power supply	18-32 VDC	18-32 VDC

ELECTRICAL HARDWARE

Hydroset drive unit
Power measurement unit
Power supply unit
Cable kit

SOFTWARE PACKAGE (OPTIONAL)

OPC Server
- Enables a seamless integration with control systems such as SCADA and DCS
- Allows total access to all the parameters in the ASRi
- Possibility to make ASRi adjustments remotely during operation

WINi
- Simultaneously control up to 9 different ASRi 2.x systems from a PC via an Ethernet network
- Control the ASRi remotely using the same graphical user interface

ASRi Reporter
- Export ASRi data to a PC for analysis and storage

Operating system compability:
- Windows 7, Windows Vista, Windows XP, Windows 2000

CT8 TANK UNIT

GENERAL CT8 DATA

Purpose	Supplies oil to the crusher and pinionshaft lubrication systems and to the Hydroset system
Control system	The crusher lubrication system is monitored by the Tank Instrumentation Monitoring System (TIMS)
No. of doors	4
No. of inspection hatches	3 located on top of unit
Cabinet material	Metal
Dimensions (LxWxH)	3,106 x 1,401 x 1,896 mm
Dry weight	1,570 kg (single main lubrication pump model) 1,740 kg (incl. standby pump)

HYDROSET SYSTEM

Oil tank reservoir capacity	200 liters
Pump design	Gear pump
Pump capacity	25 l/min (50 Hz) 30 l/min (60 Hz)

Oil filter

No. of cartridges	1
Blocked filter sensor	No

Pump motor

Type	Three-phase, squirrel cage
Power	7.5 kW
Speed	970 rpm (50 Hz) 1,180 rpm rpm (60 Hz)
Poles	6
Insulation class	F
Protection class	IP55

MAIN CRUSHER LUBRICATION SYSTEM

System design	Closed circuit, gravity return
Oil tank reservoir capacity	800 liters
Pump design	Screw pump
Standby pump	Available as option
Pump capacity	285 l/min (50 Hz) 273 l/min (60 Hz)

Pump motor

Type	Three-phase, squirrel cage
Power	11 kW
Speed	2,950 rpm (50 Hz) 3,500 rpm (60 Hz)
Insulation class	F
Protection class	IP55

Oil filters

No. of filters	6
Blocked filter sensor	Differential pressure sensor

Oil heaters

No. of heaters	3
Type	Electrical immersion
Rating	1.66 – 2.2 kW depending on voltage
Method	Indirect heating
Phases	3

PINIONSHAFT LUBRICATION SYSTEM

System design	Closed circuit, single pump, gravity return
Oil tank reservoir capacity	80 litres
Pump design	Gear pump
Pump capacity	0.70 l/min (50 Hz) 0.84 l/min (60 Hz)

Pump motor

Type	Three-phase, squirrel cage
Power	0.25 kW (50 Hz) 0.28 kW (60 Hz)
Speed	935 rpm (50 Hz) 1,122 rpm (60 Hz)
Insulation class	F
Protection class	IP55

Oil filter

No. of cartridges	1
Blocked filter sensor	Pressure switch

OVER-PRESSURE AIR SYSTEM

Type	Over-pressure air system
Air input	Blower (standard) or air regulator (option)
Air quality	Filtered
Air flow	20 m^3/h
Air pressure	~ 1 kPa
Weight (blower, hoses)	25 kg
Motor power	0.37 kW (50 Hz) 0.43 kW (60 Hz)
Motor speed	2,800 rpm (50Hz) 3,350 rpm (60 Hz)
Phases	3
Insulation class	F
Protection class	IP55

TANK INSTRUMENTATION MONITORING SYSTEM (TIMS)

The system monitors the instruments and safety devices in the tank unit for correct operation - via the plant's control system - of the various ancillary systems.

MONITORING FUNCTIONS	
Main crusher lubrication circuit	Oil temperature Oil flow Oil pressure Differential pressure across filter Oil tank temperature
Pinionshaft lubrication circuit	Oil pressure Differential pressure across filter
Over-pressure air system air	
Temperature close to spider	

OPERATIONAL FUNCTIONS
Oil heaters
Main lubrication oil pump
Pinionshaft lubrication oil pump
Over-pressure fans
Air/oil coolers
Signal permitting operation of the crusher drive motor

PLC CABINET	
Manufacturer	Siemens
Communication interface	Standard: Hard-wired communication Optional: Profinet, Profibus, Ethernet/IP, Modbus RTU, ControlNet, DeviceNet, Modbus TCP

OIL COOLING SYSTEMS (FOR MAIN CRUSHER LUBRICATION)

AIR/OIL COOLERS	
No. of units	2
Dry weight (incl. stand)	522 kg
Material	Aluminum
Oil volume	36 litres
Oil pressure drop	0.15 MPa
Oil flow rate	285 l/min (50 Hz) 273 l/min (60 Hz)
Motor power	5.5 kW
Motor speed	935 rpm (50 Hz) 1,122 rpm (60 Hz)
Max. air flow	21,000 m^3/hr 24,000 m^3/hr

WATER/OIL COOLER (OPTION)	
No. of units	1
Dry weight	150 kg
Material	Stainless steel
Mounting	Stand alone
Oil volume	13 litres
Oil pressure drop	0.13 MPa
Oil flow rate	285 l/min (50 Hz) 273 l/min (60 Hz)
Water flow rate	210 l/min ± 20
Inlet water temperature	< 30°C
Max. water feed pressure	0.30 MPa
Max. cooling capacity	50 kW

OFFLINE FILTER UNIT FOR MAIN LUBRICATION (OPTION)

Purpose	Removes particles, degrading particles, and water from the main lubrication system in a continuous slow offline filtration process
Model	27/108
Oil capacity	40 litres
Dimensions (LxWxH)	650x450x1518 mm
Weight	125 kg
Filter housing material	Cast iron
Filter type	B 27/27
No. of filter inserts	4
Blocked filter sensor	Pressure switch
Filter insert material	Cellulose
Filtration grade	3 µm absolute ($\beta_3 \geq 75$)
Pump design	Gear wheel
Pump capacity	400 l/h (50 Hz) 480 l/h (60 Hz)
Pump motor	Three phase, squirrel cage
Protection class	IP55

MANUALS

Operator's manual	CH870, CT8, ASRi	Any language
Installation manual	CH870, CT8, ASRi	Any language
Installation manual appendix	CH870, CT8, ASRi	Any language
Maintenance manual	CH870	Any language
Spare parts catalogue	CH870	English only

PERFORMANCE

CH870 – NOMINAL CAPACITY (MTPH) SECONDARY APPLICATIONS

	Concave	EC	C	MC	M
Max. feed size (mm)	Closed side setting (CSS)	170	150	130	-
	Square hole size	255	210	175	140
	Top size	350	287	236	184
Max. motor power (kW)		520	520	520	520
Eccentric throw (mm)		32-68	32-68	32-68	32-68
CSS (mm)	10	-	-	-	-
	13	-	-	-	-
	16	-	-	-	-
	19	-	-	-	351-418
	22	-	-	403-517	375-631
	25	392-466	421-541	429-721	399-671
	29	423-623	455-713	463-779	431-725
	32	446-751	480-808	489-822	455-765
	38	493-830	531-893	540-908	503-846
	44	540-905	581-978	591-995	551-926
	51	595-1001	640-1077	651-1096	606-1020
	57	642-1080	691-1162	703-1182	654-1101
	64	657-1173	750-1261	763-1283	710-1195
	70	744-1167	800-1255	814-1277	758-1189
	Mantle	A/B/FF	A/B/FF	A/B/FF	A/B

CH870 – NOMINAL CAPACITY (MTPH) TERTIARY APPLICATIONS

	Concave	MF	F	EF
Max. feed size (mm)	Closed side setting (CSS)	-	-	-
	Square hole size	90	80	75
	Top size	108 (122*)	99 (112*)	88 (100*)
Max. motor power (kW)		520	520	520
Eccentric throw (mm)		32-74	32-80	32-80
CSS (mm)	10	-	-	202-240
	13	-	236-397	219-418
	16	273-490	254-486	236-451
	19	293-559	273-521	254-484
	22	313-597	292-557	271-517
	25	332-635	310-593	288-550
	29	359-686	335-640	311-594
	32	379-724	354-676	329-627
	38	419-800	391-747	363-693
	44	459-772	428-720	398-669
	51	505-697	472-650	438-645
	57	545-649	509-605	473-562
	64	-	-	513
	70	-	-	-
	Mantle	EF/OB	EF/OB	EF/OB

* OB mantle (Oversize Breaker)

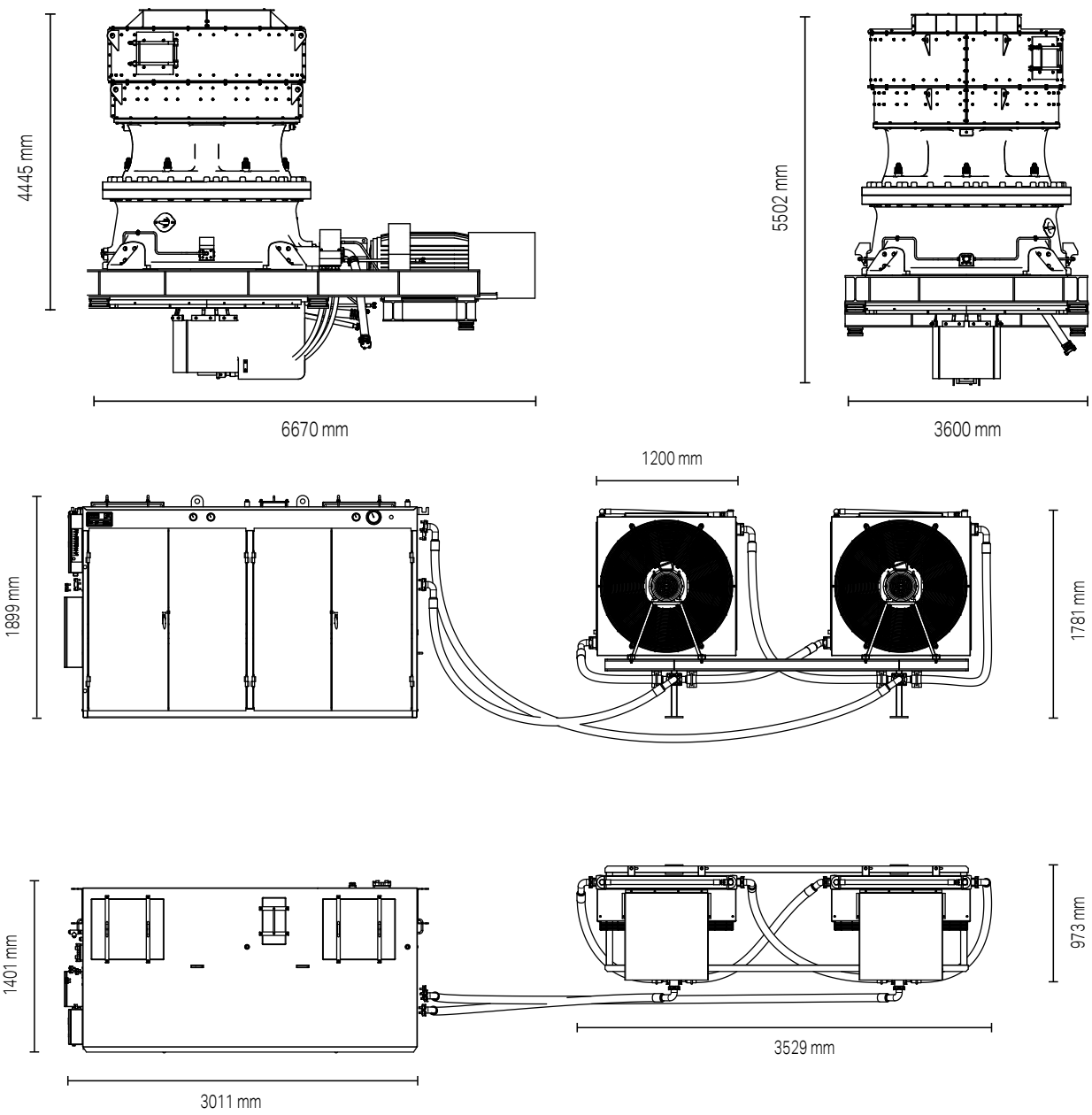
WEIGHT (KG)

Top shell assembly	13,000
Bottom shell assembly	12,700
Main shaft assembly	11,000
Pinion shaft housing assembly	740
Hydroset cylinder assembly	4,000
Feed hopper assembly	2,800
Eccentric assembly	2,100
Dust collar assembly	456

Crusher weight	50,000
Subframe	1,650
Electric motor (max.)	6,000
Coupling and shaft	450
Tolat weight (incl. subframe and drive)	58,000

* incl. splitter

DIMENSIONS*



* Always refer to the installation manuals

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