



SMART FACTORY – INDUSTRY 4.0 In grinders?



State of the art

No information about:

- Working process
- Grinding speed
- Grinding efficiency
- Real working time
- Working habits
- Actual situation





What if we change that?

Our new generation of the intelligent grinders is coming...



DEPRAG INDUSTRIAL INTELLIGENT TOOLS

Our new intelligent grinder reaching smart factory – DIQ

Built-in special module

- Autonomous system
- No external energy is needed
- Wireless communication
- Permanent monitoring of the tool



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SMART FACTORY – Industry 4.0: In Grinders?

Our new intelligent grinder reaching smart factory – DIQ

- The special built-in module consists of:
- Power generator unit
- Lithium battery
- Internal memory
- Real time clock RTC unit
- Internal evaluation CPU
- Special sensors to monitor the tool
- Working under special operational system
- Wireless communication: Free band 868 MHz, 916 MHz or 433 MHz
- RF range: 10+ m in buildings, 100+ m in open space







DIQ system – Basic principle communication



DIQ system – Basic operating modes

Working



Communication



- Continuous checking all parameters
- Evaluation the measured values
- Storing the important data

- Communication with the GW
- Sending all stored data
- Receiving the new orders

DIQ application and Industrie 4.0 – Dashboard







DIQ application and Industrie 4.0 – Dashboard

Fast overview on all tools and easy recognition OK or not OK statement. Available information what to do...



DIQ application and Industrie 4.0 – Company structure

- Whole history
- Company hierarchy
- Tool recognizing
- Tool identification
- Online documentation

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<u>company</u> > <u>workers</u>											
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DIQ application and Industrie 4.0 – Tool card

- First launch of the tool
- Regular maintenance information
- History of the workers deals with the tool
- Total working time of the tool
- Total cost of the tool repairs
- Total used compressed air

WORKED		WORKERS - HISTORY			SERVICE COSTS - HISTORY		
parameter	value	worker	date		type of service	price	
hours worked, total	206.23 hour	Josef	31.12.2016		Mazivo	525 Kč	
hours worked, load	206.23 hour	Show more			Kontrola těsnosti převodovky	666 Kč	
total air consumption	23758.02 m ³				Show more		

date	type of service	price (Σ 1 191 Kč)
31.12.2016	Mazivo	525 Kč

ASIC LARAMETERS	
parameter	value
Name	GAQ818-230BX(E5)
type	Bruska úhlová GAQ818-230BX
serial number	16/70122250
weight	4.40 kg
speed	8000.00 rpm
diameter of grinding wheel	180.00 mm
air consumption	2.50 m³/min
power	2300.00 W

PACIC DADAMETERS

OTHER PARAMETERS

parameter	value
classification	
date of introduction into production	1.1.2016
last service date	6.6.2016
last registration - date	9.6.2016
end of warranty	0.0.000
service - total costs	1191 Kč



those GAQ818-230BX(E5) do

ORKED		WORKERS	- HISTORY	SERVICE COSTS - HISTOR	Y	BASIC PARAMETERS		OTHER PARAMETERS	
parameter	value	worker	date	type of service	price (X 1 191 Kč)	parameter	value	parameter	va
hours worked, total	206.23 hour	Josef	31.12.2016	Mazivo	525 Kč	Name	GAQ818-230EX(E5)	classification	
hours worked, load	206.23 hour	Show more		Kontrola těsnosti převodovky	666 KZ	type	Bruska úhlová GAQ818-230BX	date of introduction into production	1.1
total air consumption	23758.02 m ^a			Show more		serial number	16/70122250	last service date	6.6
						weight	4.40 kg	last registration - date	9.6
						speed	8000.00 rpm	end of warranty	0.0
						diameter of grinding wheel	180.00 mm	service - total costs	111
						air consumption	2.50 m²/min		
						power	2300.00 W		



DIQ application and Industrie 4.0 – Actual information

- Online status
- Continuous speed control
- Permanent tool condition monitoring
- Service intervals based on actual conditions
- Potential problem warnings



		tools 🗞 🖕	name of worker 🔌	condition $\otimes \frac{1}{2}$	company 🗞 🌻	hours 🕲	loaded 🛛 🗞 🌲	service 🗞
1	\odot	GAQ818-230BX(E9)	František Brousivý	ОК	Kasi	50.49	30.5.2016 7:20:32	19.5.2016 9:10:19
2	\odot	GAQ818-230BX(E5)	Josef Novák	ОК	Kasi	206.23	9.6.2016 3:29:36	6.6.2016 8:27:01
3	\odot	GAQ818-230BX(87)		OK	Kasi	612	30.3.2016 0:00:00	€ 2.6.2016 13:30:13



DIQ application and Industrie 4.0 – Evaluation and reports

- Visualization of the
- working effectivity
- optimal grinding speed
- tool loading or potential overloading
- average and total air consumption
- ambient temperature peaks
- work off hours

All data displayed in the time scale.



DEPRAC

FAST FILTERS





DIQ application and Industrie 4.0 – Evaluation and reports

Comparing of the tools effectivity







Key Advantages

- □ Complete overview of the total tool process
- Access to complete operating data
- □ Complete control of the grinder and the operational process
- □ Recommendations to reach the tools' optimum parameter
- □ Recommendations in regard to the most-suitable tool for any given fabrication task
- Comparison of different tools and/or operators
- Constant tool supervision
- Optimization possibilities in regards to the speed and workload of any given tool
- □ Preventive maintenance capability by exact monitoring of the service intervals
- Operating-hours counter
- □ Measuring values for air-consumption improved production scheduling
- □ Energy- and cost saving



Sales Model

Tools with DIQ Technology						
Model No.	Part No.					
GAQ 812-190BX	6061275E					
GAQ 815-190BX	6061275F					
GAQ 818-190BX	6061275G					
GAQ 818-250BX	6060970D					
GAQ 823-190BX	6061275H					
GAQ 823-250BX	6060971D					



Optional Equipment	
Description	Part No.
Device GW-ETH-02A (72D)	6080094
Device GW-ETH-02A (72D) incl. protective cover IP54	6022835A
Device GW-ETH-02A (72D) IP54 (without GW)	6022802
Software BASIC (monthly license)	6078981
Software BASIC (annual license)	6078983
Software MASTER (monthly license)	6078982
Software MASTER (annual license)	6078984







THANK YOU!